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APRIL 1947

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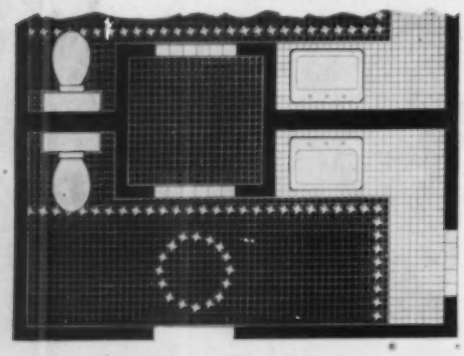

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ARCHITECTURAL RECORD

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THE RECORD REPORTS

Means of Reducing Building Costs Sought • Housing Legislation Is Slow to Appear • Home Builders Hold Lively Session • New Building Code Group Convenes

The key question among building contractors no longer is one of learning to live with or escape from government controls but of putting together rising costs, growing selectivity by customers, and an adequate profit margin, and making them all match.

Taking the cost side, the Bureau of Labor Statistics found that average wholesale prices of building materials jumped 8 per cent in November — the largest monthly rise in 26 years — going 62 per cent above the prewar level. Although union wage scales have been steady, reports to the agencies indicate that contractors everywhere must be ready to pay above scale. Finally, although materials are in better supply, there are still shortages, which force suspensions of work. And time, of course, is money.

Whether the cost-price situation will settle is the key question in Washington as elsewhere; it is the problem raised in practically every industry. And the Washington experts have nothing to promise. The only way of getting costs down, they think, is the hard one — cutting corners, standardizing techniques, shopping the materials markets for bargains, etc. As for a general decline, that could well prove too much of a good thing.

Against the upward trend in costs are several factors which may work in the opposite direction. Builders themselves say they are trying hard. The National Association of Home Builders, following its recent convention (see page 16), is launching a series of conferences, under a plan by the new president, Edward R. Carr, with labor and materials men. The association hopes for an increase in apprentices and for higher production per worker.

Ban Secondary Boycotts?

The various veterans' organizations are asking the Justice Department to look into practices of construction workers and the House Labor Committee is probing specific charges. Indeed, prospective changes in labor law may do something, if not a great deal, to reduce costs. Among the few things about which there seemed to be little disagreement was that the law must prohibit secondary boycotts. These, according to the testimony before Congress, afflict the building industry particularly.

Secondary boycotts had some but not many defenders. Testimony against them, coming entirely from management representatives, charged that producer-union collusion closed major markets to key building appliances. For instance, the New York as well as other top markets, is supposed to be closed to part of the electrical appliance industry. Like charges were raised with respect to other materials or components. If the allegations are true, new law presumably will allow contractors and architects to look beyond the immediate neighborhood for many components.

Rental Projects Pushed

With supply and demand situations rather out of line with respect to one-family residences, the government has been promising to push apartment construction. In March, NHA asked Congress to extend mortgage insurance authority to finance additional rental housing. The builders themselves express hope. However, the cost factor versus rental returns has operated here even more than in home building. Controls over rent may be relaxed or eliminated altogether; the apartment builder must look, however, not to immediate but to long-term returns to amortize and yield some profit on his investment. The demand for more apartment construction is, of course, not exclusively a matter of high costs for single family houses; it also is based on normal desires of new families and of families whose incomes do not warrant ownership.

Controls Move Out

As final vestiges of federal controls were being swept out the door, it was taken for granted that, while production and construction generally might spurt, there would be temporary dislocations and some maldistribution. There were questions, for instance, about pig iron and the need for it to relieve the boxcar shortage. Shifts to railroad needs would affect the auto industry and could cause further trouble for such housing items as soil pipe, electrical fixtures and structural steel. On the other hand, removal of controls would not disturb the flow of lumber, brick, nails, flooring, trim or glass.

Congress was among those pressing for a house cleaning on government controls; in fact, one of the appropriation committees officially called for an end to OTC, OPA, CPA and OWMR by June 30 — and remember that agencies cannot function without funds from these focal committees.

Legislation Is Slow

As to housing legislation itself, rents excepted, the lawmakers were moving slowly. There was doubt as to how much could be done during the current session. Nevertheless, Chairman Wolcott of the House Banking Committee, which handles housing, moved ahead with plans to repeal most of the Veterans

(*Continued on page 10*)

"The delegate from Ethiopia doesn't see the point in leaving out the 13th floor."
— Drawn for the RECORD *by Alan Dunn*

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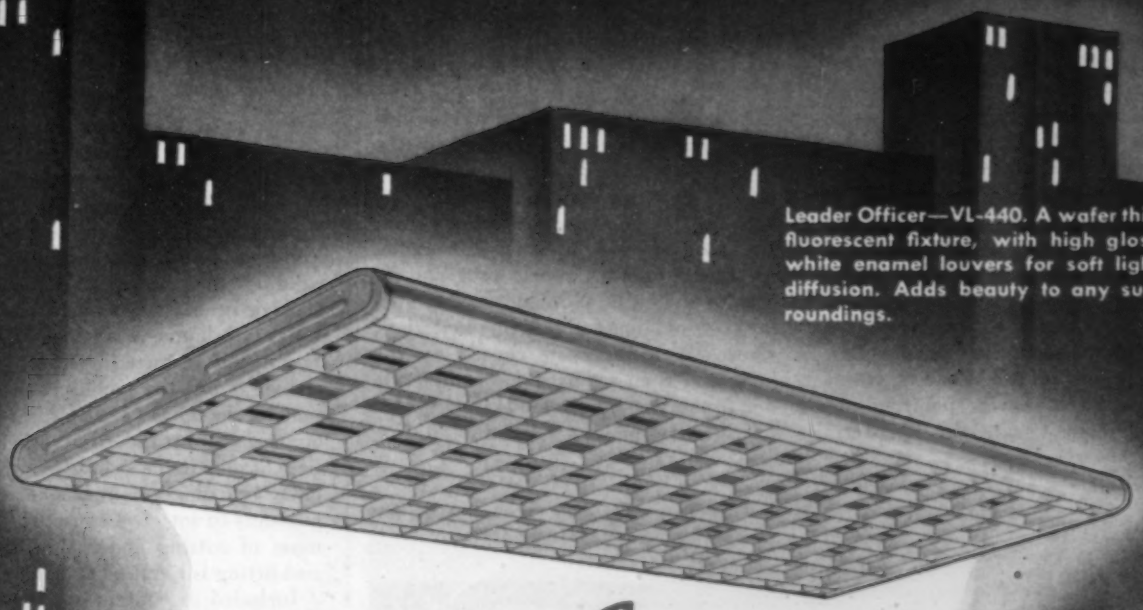

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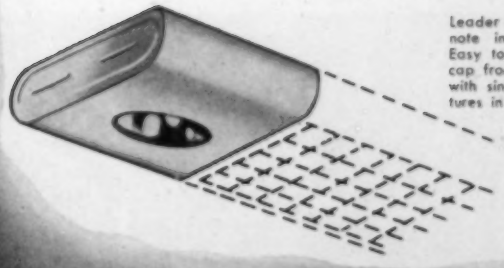

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THE RECORD REPORTS (*Continued from page 7*)

Emergency Housing Authority. He raised a question as to maximum prices on new construction and as to ceilings on new rental structures. The Senate committee moved to up present rents and to take ceilings off new units.

Significantly, Rep. Wolcott expressed alarm over federal financing of home construction from the standpoint of encouraging veterans to buy homes beyond their means, resulting in early liquidation and increasing government liability. At the same time, incidentally, John H. Fahey of the Federal Home Loan Bank agency was pointing out that the interest rate on long-term amortized mortgages was too low to be safe and should not be allowed to drop below 5 per cent.

Congress got word of increased building costs not only from the industry but also from the President as a result of the government's activity in the housing field under the Lanham Act. He asked for an additional $50 million for the temporary re-use program for schools and cities. Note his words: "Rising costs of labor and building materials, as well as rising costs caused by the increased time required for completion due to shortages, have made it necessary for the government several times during the past year to cut back the temporary re-use program." He wanted the additional funds to pay extra costs in carrying out the original program.

Plan "Engineered House"

Interest in Washington is growing in the so-called "industry engineered house," sponsored by The Producers' Council and the National Retail Lumber Dealers Association more to demonstrate economies which can be made in home building than to develop new house plans or promote any particular type or design of home. Principal savings in design and engineering arise, it is explained, from the fact that the dimensions of the houses are coordinated with dimensions of standard materials. Stock sizes of such items as lumber, wallboard, brick and tile, cement blocks and other products fit into the house with a minimum of cutting and fitting, if cutting and fitting is required at all.

Included in contentions for the program are economies in manufacture, greater degree of mass production, and savings in inventories, both at the point of manufacture and in dealers' stocks. Greatest savings are to be made, Washington officials are being told, at the construction site.

Experiments Continue

The federal government continues its encouragement to experiments in new materials, improved designs and construction methods. It recently came out with a survey of lightweight aggregates for concrete, an assembly of information from the industry itself. NHA is sponsoring a special research and testing program on monolithic concrete using lightweight aggregate materials and is working with both the National Bureau of Standards and the Bureau of Reclamation. Preliminary tests to determine density, strength and insulation properties will be followed by structural tests — all aimed at developing engineering data.

(*Continued on page 12*)

Louis Checkman Photo

Model of the Museum of Modern Art, New York, showing proposed new wing at right

BUILDING NOTES

New Museum Wing

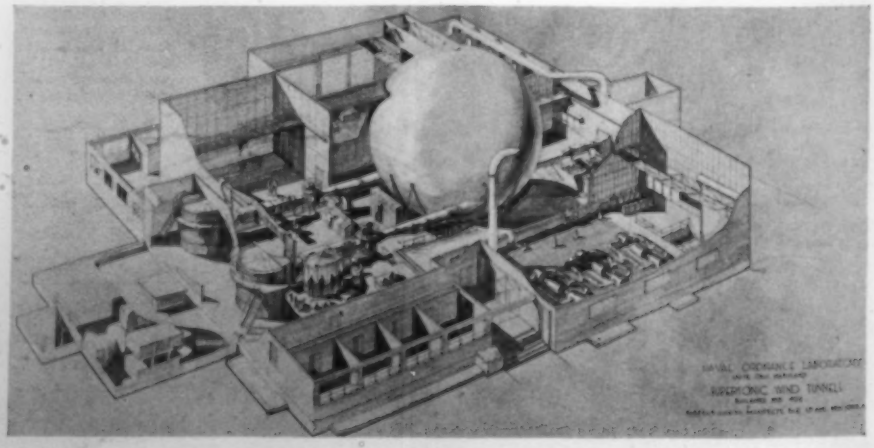
The Museum of Modern Art, New York City, has announced plans for a new wing which will practically double present exhibition and gallery facilities.

The proposed addition, designed by Philip L. Goodwin, co-designer with Edward D. Stone of the present museum building, will be three stories in height, and in the same architectural style as the existing building. The first floor will contain 3847 sq. ft., or slightly more than on the main floor of the original structure. New exhibition techniques will be used to make the fullest possible use of wall space.

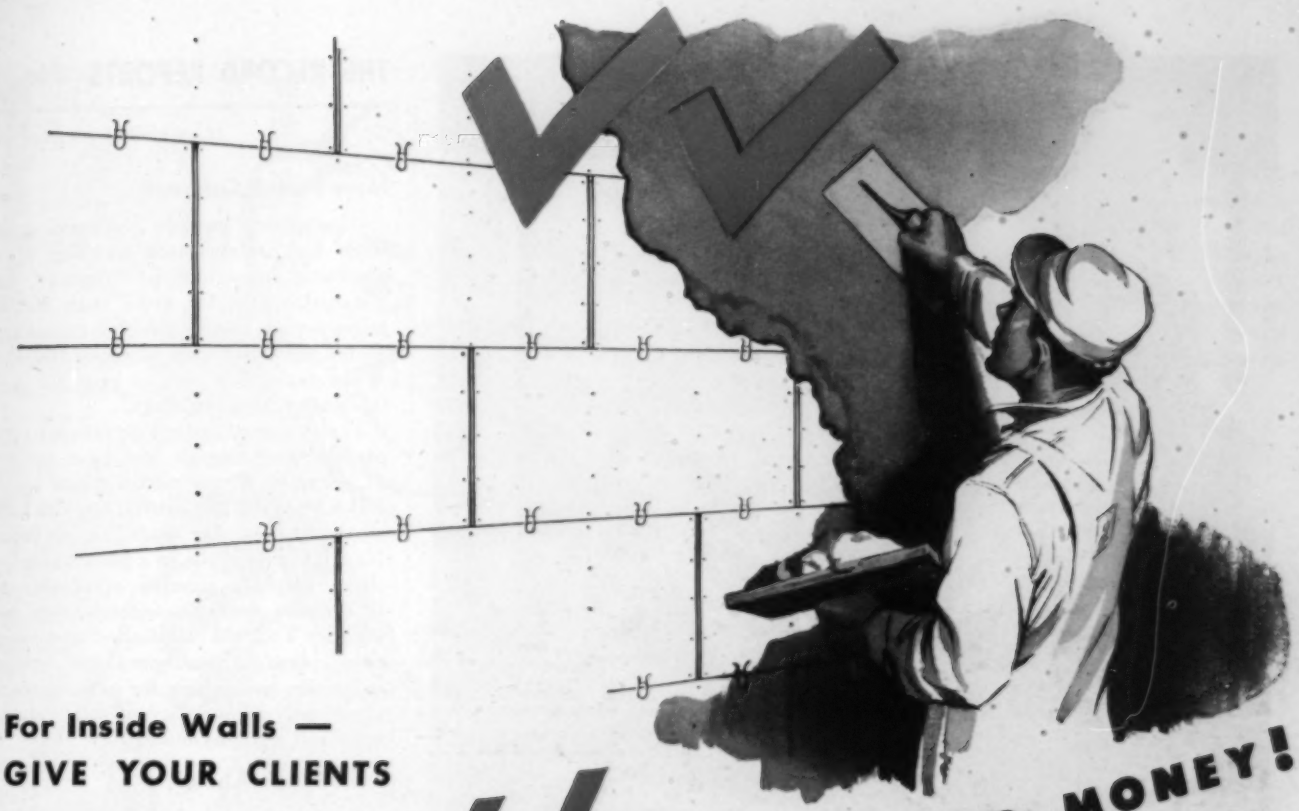
Ordnance Laboratory

A German-built supersonic wind tunnel, captured by American forces at Kochel, Bavaria, disassembled and shipped to this country, will be one of the principal tools of research at the Naval Ordnance Laboratory now under construction at White Oak, Md. The wind tunnel is being reconstructed in a building especially planned for the development of projectiles, rockets, and guided missiles.

The wind tunnel structure is but one of some 50 buildings incorporated in the Naval Ordnance Laboratory project occupying a site of about 938 acres and involving an expenditure of $15 million. Eggers & Higgins, of New York, in association with Taylor and Fisher, Baltimore, are the architects.



A supersonic wind tunnel will be a main feature of the Navy's new Ordnance Laboratory



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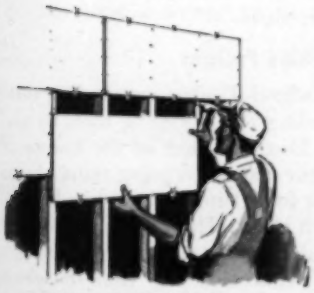

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THE RECORD REPORTS

(*Continued from page 10*)

More Prefab Contracts

Guaranteed market contracts continue for prefabricated housing. New contracts announced in February, for instance, called for more than 30,000 factory-made homes. Officials expect the prefab total this year to reach 100,000. A big demand is said to exist for prefabricated farm buildings.

Factory shipments of permanent-type prefabricated homes last year totaled 37,200 units, 79 per cent of them wood. NHA qualified 288 plants, but the bulk of the houses was made by 50 firms. Now the industry is in a period of transition with the number of plants due to dwindle through consolidations and failures. Too, old established companies using plywood, wallboard and lumber materials are waiting for newcomers to prove the adaptability of steel, aluminum and vitreous enamel.

CPA Looks Ahead

In what is, perhaps, its last look ahead for the economic scene, the Civilian Production Administration recently placed strong emphasis on the role of construction in the nation's production outlook for the year. It foresaw a 50 per cent dollar increase and an increase of about one third in physical volume. As to building materials, it counted on production to support the anticipated boost in construction. In almost every case, it judged, output will match or exceed that of 1941, when the physical volume of building exceeded the estimates for this year. It warned, however, that allowance must be made for larger residential requirements, as well as for the backlog of demand and virtually empty pipelines.

FTC Tackles Freight

The Federal Trade Commission, notwithstanding the licking it took in the Chicago District Court at the hands of the cement makers, is going right ahead trying to force suppliers to ship F.O.B. their own plant. The idea is to get rid of alleged discriminations.

The Commission has won decisions which firmly outlaw charging the customer more for freight than the actual freight bill. But it has never been satisfied. It wants the total bill to include freight exactly. In the cement case, it charged conspiracy and absorption of freight costs to some customers. The District Court denied that the first had been proved and that the second is necessarily discriminatory; it might, instead, be the mere result of trying to meet competition.

While the cement issue was being ap-

(*Continued on page 14*)

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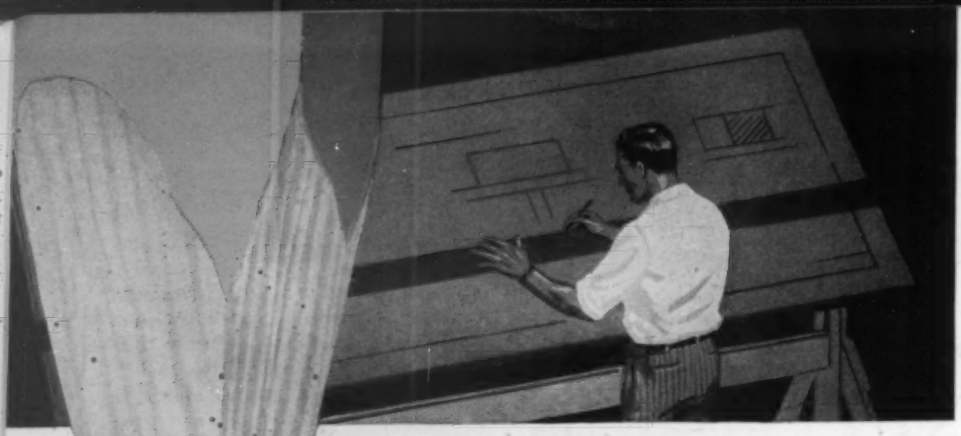

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THE RECORD REPORTS

(*Continued from page 12*)

pealed to the Supreme Court, the FTC went ahead bringing somewhat similar charges against the sewer pipe makers. They, too, were charged with conspiring. Their pricing system, which involves a series of pricing zones, according to FTC, was said to discriminate.

Ultimate ideal of FTC is to prevent anything but the flat billing of freight so that those nearest the source of supply do best. Whether it can achieve it under present law is still unclear; hence, there is some talk of trying to get help from Congress. Commission officials think that final victory, whether by legislation or the courts, would lead to the relocation of plants.

From Here and There

From various government sources come points of interest. The Federal Works Agency reports that in the preparation of state and local project plans, advances approved by the Bureau of Community Facilities through last December cover an estimated construction cost of $1,529,211,000. The total volume that can be planned with the $65 million thus far appropriated is estimated at about $2.1 billion. Plan preparations completed without federal aid reached $1.3 billion, concentrated in a few states and large cities.

The Department of Commerce reports that winter building techniques in the small-house field have not kept pace with those used in large construction. The housing field, it says, is wide open for a new class of subcontractor — the winterizing or winter-proofing subcontractor — who would provide some sort of enclosing arrangement including heat and light for small house construction.

The Federal Home Loan Bank Administration advises that non-farm real estate financing continued to a new high in 1946 when about $10.4 billion of mortgages were recorded, 85 per cent greater than 1945 and 120 per cent above 1941.

The Bureau of Labor Statistics states that 25 per cent fewer man-hours were needed in 1946 than in 1935 to manufacture 1000 sq. ft. of Douglas fir plywood at the mill.

Production May Be Sufficient

Production of almost all items of construction materials is expected to be sufficient in 1947 to meet the demands of the anticipated large building program, the Construction Division of the Department of Commerce reports.

Large increases in production of practically all construction materials were registered in 1946, in many cases exceeding shipments or production in 1941.

(*Continued on page 16*)

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THE RECORD REPORTS

(*Continued from page 14*)

Prospects for this year are that output will continue to increase, according to the Construction Division's survey.

Asphalt roofing materials and gypsum board (including lath), were among the materials that attained record levels in 1946. Lumber and a few other materials came very close to the previous peak levels achieved in 1941 and 1942.

Some of the difficulties encountered by builders last year will again appear in 1947, says CD, because the supply-demand situation will be too closely matched for comfort. For construction materials to be in easy supply, production must exceed demand by a margin of at least one or two months production — that is, 10 to 15 per cent above the annual total — or else this margin must be provided by inventories at various distribution levels. At present there is no sizeable inventory cushion.

Despite the generally favorable outlook for 1947, the report concludes, there still is a chance of absolute shortages of a few materials such as cast iron soil pipe and inexpensive wiring devices and electrical products made of steel.

❖ ❖ ❖

EMBATTLED BUILDERS MEET IN CHICAGO

Under the aegis of the National Association of Home Builders, some 6000 builders met, talked, listened, applauded, argued, and elected, at the Stevens Hotel during the last days of February. Between (and during) conference sessions they inspected the extensive, well-staged exhibition of new building materials and equipment, visited the full-sized Celotex Cemesto house next door, or analyzed the Ingersoll Utility Units at the Congress Hotel.

Prime topic of discussion was the elimination of government controls, emphasized throughout many sessions, and culminating in the address of Representative Jesse P. Wolcott, Chairman of the House Banking Committee at the final banquet, Wednesday, February 26. Builders heard him state that he will introduce legislation designed to repeal the Veterans' Emergency Housing Act of 1946 (Patman Act), with the exception of Title VI FHA guarantees, and retaining some kind of veterans' preference as renters or buyers. He suggested rent controls on existing properties be continued until March 1948 where such controls seemed necessary.

Bob Gerholz, on the opening day, stated "our fight to decontrol must continue to be the order of the day." With

(*Continued on page 18*)

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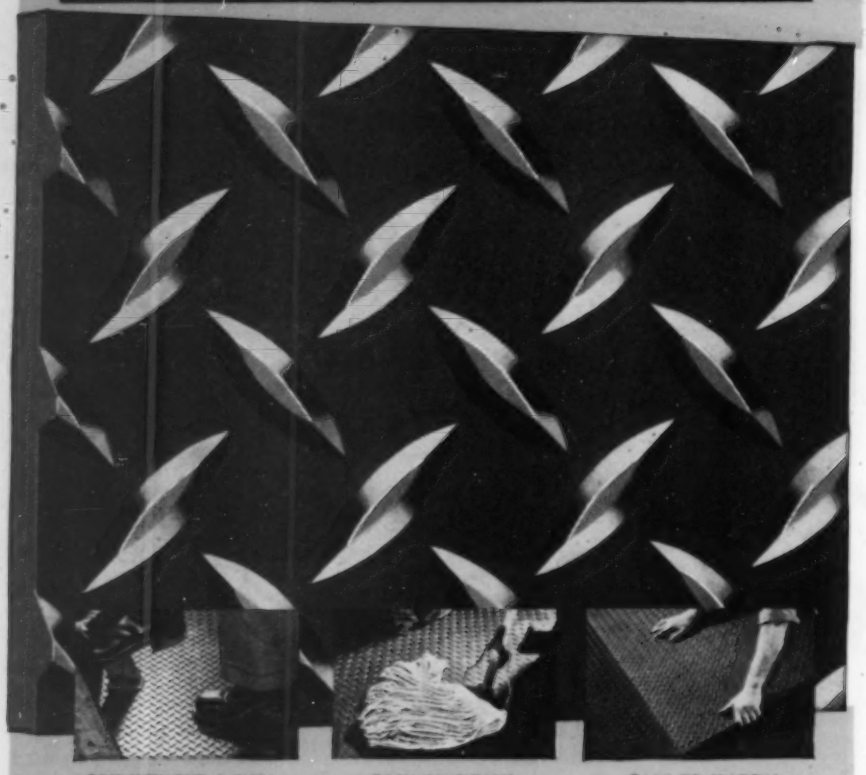

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THE RECORD REPORTS

(*Continued from page 16*)

regard to prices, number two item of importance, he said "labor must throw off restrictive and make-work practices. The producer must unscramble combinations and trade operations that increase prices." The next day Raymond M. Foley, Administrator of FHA stated that "while costs remain high, the average veteran can better afford to rent, even though the rent must reflect the higher costs, than he can afford to buy. We believe the FHA is now in a position to give the utmost aid to rental housing."

Arthur Binns waxed eloquent and dramatic in denouncing restrictive labor practices and advocating increased productivity of labor as the greatest factor in reducing costs. Eloquent spokesmen for veterans' organizations stressed the same points.

N.A.H.B. went on record as advocating Congressional action to abolish the closed shop which "denies the inherent right of free men to work." Its statement of policy condemned restrictive practices by labor as monopolistic and as putting an additional cost burden on the construction of homes. It advocated a ratio of journeymen to apprentices of 4–1 rather than the usual 12–1. It stated that: "Underlying all these difficulties is a basic philosophy of artificial shortage enforced by labor. This shortage policy is founded on economic misconception which in the long run can have only the most damaging effects upon labor and builders.

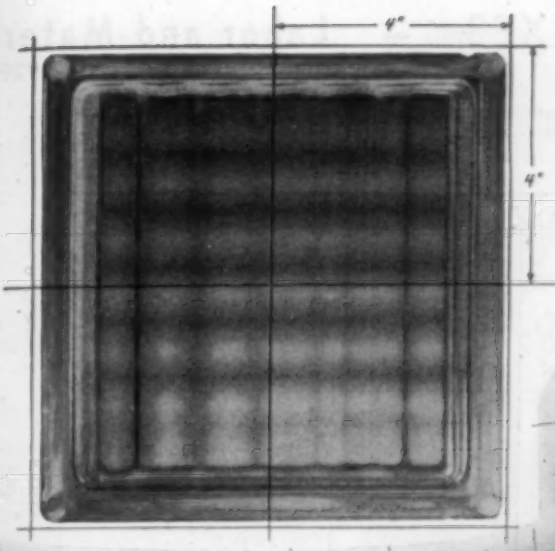
"We call upon labor to cooperate to end malpractices. In turn we pledge our earnest efforts to maintain steady output in order that benefits of steady employment may be achieved."

Frank R. Creedon, National Housing Expediter, reported on the changes he had made in attempting to make government controls less onerous. He stated his belief that if non-residential construction were unrestricted "not only would the materials situation be utterly chaotic, but the bidding for building material would end in costs spiralling upward." Many home builders disagreed, some were in accord.

Panel sessions were lively, with vehement debate, and took up the subjects Status and Outlook for Veterans' Housing; Mortgage Financing; Labor, including Apprenticeship Training, Wages, and Productivity; New Building Material and Methods. Also forums were conducted on heating, on lumber, and on cement.

Edward R. Carr, Washington, was elected president, Rodney M. Lockwood, Detroit, first vice-president, L. J. Boggs, Atlanta, secretary, and Milton J.

(*Continued on page 142*)



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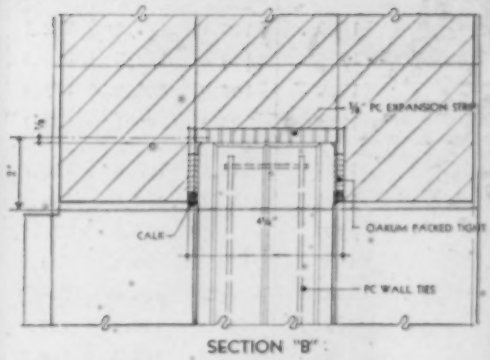
This is just one of the reasons why PC Glass Blocks have been so widely specified for light openings in outer walls and for interior partitions. For PC Glass Blocks also transmit daylight generously. They provide excellent insulation. They deaden outside noises, preserve privacy, and are exceptionally attractive in appearance wherever used.

Send for this Free Book

We have recently published a 36-page book in which the many and varied uses of PC Glass Blocks are described and illustrated. The book also contains many detail drawings—such as the one shown here. We shall be glad to send you a *free* copy. Just mail the convenient coupon to Pittsburgh Corning Corporation, Room 613, 632 Duquesne Way, Pittsburgh 22, Pennsylvania.



SECTION "B"

This typical jamb section illustrates the application of modular coordination to the basic principles of glass block installation. Here—and in the various modular details shown in our book—the red lines represent the standard grid based on the 4" module.

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CONSTRUCTION COST INDEXES — Labor and Materials

United States average 1926—1929 = 100

Compiled by Clyde Shute, manager, Statistical and Research Division, F. W. Dodge Corporation, from data collected by E. H. Boeckh & Associates, Inc.

NEW YORK

Period	Residential		Apts., Hotels, Office Bldgs.	Commercial and Factory Buildings	
	Brick	Frame	Brick and Concr.	Brick and Concr.	Brick and Steel
1920	136.1	136.9	123.3	123.6	122.6
1925	121.5	122.8	111.4	113.3	110.3
1930	127.0	126.7	124.1	128.0	123.6
1935	93.8	91.3	104.7	108.5	105.5
1939	123.5	122.4	130.7	133.4	130.1
1940	126.3	125.1	132.2	135.1	131.4
1941	134.5	135.1	135.1	137.2	134.5
1942	139.1	140.7	137.9	139.3	137.1
1943	142.5	144.5	140.2	141.7	139.0
1944	153.1	154.3	149.6	152.6	149.6
1945	160.5	161.7	156.3	158.0	155.4
1946	181.8	182.4	177.2	179.0	174.8
Jan. 1947	195.4	198.0	183.9	186.2	183.0
	% increase over 1939				
Jan. 1947	**58.2**	**61.8**	**40.7**	**39.6**	**40.7**

ATLANTA

Period	Residential		Apts., Hotels, Office Bldgs.	Commercial and Factory Buildings	
	Brick	Frame	Brick and Concr.	Brick and Concr.	Brick and Steel
1920	122.8	122.9	108.6	109.8	105.7
1925	86.4	85.0	88.6	92.5	83.4
1930	82.1	80.9	84.5	86.1	83.6
1935	72.3	67.9	84.0	87.1	85.1
1939	86.3	83.1	95.1	97.4	94.7
1940	91.0	89.0	96.9	98.5	97.5
1941	97.5	96.1	99.9	101.4	100.8
1942	102.8	102.5	104.4	104.9	105.1
1943	109.2	109.8	108.5	108.1	108.7
1944	123.2	124.5	117.3	117.2	118.2
1945	132.1	133.9	123.2	122.8	123.3
1946	148.1	149.2	136.8	136.4	135.1
Jan. 1947	161.9	164.2	145.7	147.1	145.8
	% increase over 1939				
Jan. 1947	**87.6**	**97.6**	**53.2**	**51.0**	**54.0**

ST. LOUIS

Period	Residential		Apts., Hotels, Office Bldgs.	Commercial and Factory Buildings	
	Brick	Frame	Brick and Concr.	Brick and Concr.	Brick and Steel
1920	118.1	121.1	112.1	110.7	113.1
1925	118.6	118.4	116.3	118.1	114.4
1930	108.9	108.3	112.4	115.3	111.3
1935	95.1	90.1	104.1	108.3	105.4
1939	110.2	107.0	118.7	119.8	119.0
1940	112.6	110.1	119.3	120.3	119.4
1941	118.8	118.0	121.2	121.7	122.2
1942	124.5	123.3	126.9	128.6	126.9
1943	128.2	126.4	131.2	133.3	130.3
1944	138.4	138.4	135.7	136.7	136.6
1945	152.8	152.3	146.2	148.5	145.6
1946	167.1	167.4	159.1	161.1	158.1
Jan. 1947	183.4	183.8	168.5	169.3	169.5
	% increase over 1939				
Jan. 1947	**66.4**	**71.8**	**42.0**	**41.3**	**42.4**

SAN FRANCISCO

Period	Residential		Apts., Hotels, Office Bldgs.	Commercial and Factory Buildings	
	Brick	Frame	Brick and Concr.	Brick and Concr.	Brick and Steel
1920	108.8	107.5	115.2	115.1	122.1
1925	91.0	86.5	99.5	102.1	98.0
1930	90.8	86.8	100.4	104.9	100.4
1935	89.5	84.5	96.4	103.7	99.7
1939	105.6	99.3	117.4	121.9	116.5
1940	106.4	101.2	116.3	120.1	115.5
1941	116.3	112.9	120.5	123.4	124.3
1942	123.6	120.1	127.5	129.3	130.8
1943	131.3	127.7	133.2	136.6	136.3
1944	139.4	137.1	139.4	142.0	142.4
1945	146.2	144.3	144.5	146.8	147.9
1946	159.7	157.5	157.9	159.3	160.0
Jan. 1947	173.2	170.8	167.3	169.4	172.5
	% increase over 1939				
Jan. 1947	**64.0**	**72.0**	**42.5**	**39.0**	**48.1**

The index numbers shown are for combined material and labor costs. The indexes for each separate type of construction relate to the United States average for 1926–29 for that particular type — considered 100.

Cost comparisons, as percentage differences for any particular type of construction, are possible between localities, or periods of time within the same city, by dividing the difference between the two index numbers by one of them; i.e.:

index for city A = 110
index for city B = 95

(both indexes must be for the same type of construction).

Then: costs in A are approximately 16 per cent higher than in B.

$$\frac{110-95}{95} = 0.158$$

Conversely: cost in B are approximately 14 per cent lower than in A.

$$\frac{110-95}{110} = 0.136$$

Cost comparisons cannot be made between different types of construction because the index numbers for each type relate to a different U. S. average for 1926–29.

Material prices and wage rates used in the current indexes make no allowance for payments in excess of published legal prices, thus, indexes reflect minimum costs and not necessarily actual costs.

These index numbers will appear whenever changes are significant.

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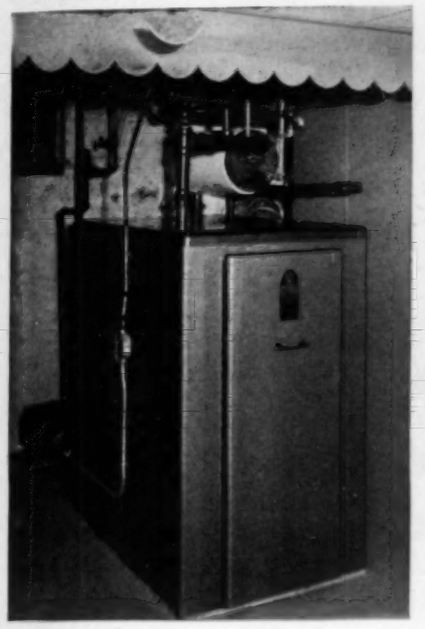

B & G Hydro-Flo *Heat is the preferred system for homes, apartments and industrial buildings. Its time-tested equipment can be installed on any hot water heating boiler.*

This B & G *Hydro-Flo* Heating installation with convectors is a credit to the installing contractor for his good workmanship and to the builder for his good judgment. Just as for all other kinds of radiation, *convectors are best served by forced hot water!*

B & G *Hydro-Flo* Heating provides smooth, positive control of heating medium temperatures . . . automatically adjusting the heat supply to meet changes in the weather. With simple, dependable equipment, indoor temperature is maintained uniformly at whatever degree is desired.

This system is really versatile! Note the unit heater in the recreation room—it serves to quickly dry those articles of clothing every woman prefers to launder herself. Note, too, the space-saving neatness of the *single main* Monoflo piping . . . the compact boiler hook-up.

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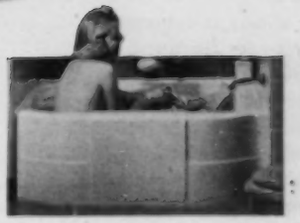

The cost of hot water for personal and household cleanliness is an important consideration for today's home owner. Remember that modern labor-saving devices, such as dish and clothes washers need plenty of hot water for satisfactory operation. The B & G *Hydro-Flo* Water Heater provides it—*all around the clock and calendar*—at so low a cost that it can be used unsparingly.

Hydro-Flo* HEAT

BELL & GOSSETT COMPANY

Dept. Y-32, Morton Grove, Illinois

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REQUIRED READING

FRENCHMAN'S AMERICA

When the Cathedrals Were White: A Journey to the Country of Timid People. By Le Corbusier. Translated from the French by Francis E. Hyslop, Jr. New York 18 (8 W. 40th St.), Reynal & Hitchcock, Inc., 1947. 5½ by 8 in. xxii + 218 pp. illus. $3.00.

Inimitable Le Corbusier! Who but he could write this book of contradictions about the city of contradictions which is New York? Who but he could crowd into a brief 200 pages a galaxy of adjectives, exclamation points, theories, philosophies, the shrewdest of appraisals, praise, blame, the staccato and the poetic?

New York's skyscrapers are too small, says Le Corbusier. They are too many. They are "sublime, naïve, touching, idiotic," "an architectural accident," they have crowns "which seem like chased decanter stoppers," they "speak of the spiritual explosion of uncontrolled youth."

"The George Washington Bridge over the Hudson," he finds, "is the most beautiful bridge in the world. . . . It is blessed. It is the only seat of grace in the disordered city." Grand Central Terminal is a "marvel," where train-taking is a pleasure excursion. New York's newspapers are too big — the Sunday edition weighs 2½ pounds! "In New York events have everywhere got ahead of the control of spirit. It is a titanic effort of organization and discipline in the midst of a chaos brought about by the speed of accelerated times; it is a kind of snorting monster, bursting with health, sprawled out at ease. There is a geometric progression of chaos. Encephalitis in the New York region: twelve million men dedicated to hard labor." Does Le Corbusier love or hate New York? Both! (Doesn't the New Yorker himself do the same?)

But this isn't a book solely about the new capital city of the world. It is a book about America, and, for atmosphere, about France. It is a series of essays on American characteristics and characters, foibles and fortitude. Le Corbusier is not exactly gentle in his appraisal of us, and he is not infrequently disconcerting in his x-ray diagnosis. "*Reality*," he says, "that is the lesson of America." He marvels at our colleges where every student is made into an athlete, at our stadia packed to the clouds with sports fans, at our commuters' trains. He is dismayed at the gridiron pattern of our cities, at our slums. And he subtitles his book "A Journey to the Land of Timid People"!

Why *timid*? Our timidity, says Le Corbusier, is betrayed in the "gigantomachy" of our city planning; "it is the result of a lack of equilibrium, of unbalance, and it carries with it rather serious disturbances of the core of the social cell — the key of everything: the family." *Touché*, M. Le Corbusier! But you are not the first European who has found immaturity and uncertainty in the American loud-spokenness and braggadocio. That is the traditional European attitude toward Americans, is it not?

The fundamental argument put forward by Le Corbusier in this volume is one for the reorganization of American cities for the benefit of their inhabitants. More trees, more open spaces, more room in which to breathe, he demands. Put up larger skyscrapers, with plenty of room between them. Give man room in which to see the sky, give him a decent place to live. Make it easier for him to get from his home to his place of business. Cut down his working hours so that he will have time to play, to *live*. Cut down his working time, in fact, to four hours "of productive work necessary (and sufficient) for production; machines effect their miracle." Give him eight hours of sleep, allow him an hour for transportation — and he will have *eleven hours* left for leisure every day!

It took ten years for this book to reach an American audience. First appearing in France in 1938–39 in *Direction*, it was at that time translated into English but all prospective publishers insisted upon omitting the first section dealing with France. Now at last comes this new translation, and an American edition which is complete. Nothing has occurred in the past decade to out-date a single word of the original manuscript — a more telling criticism of America and Americans, perhaps, than the sharpest barb of the text itself.

THE UNIVERSAL ART

Architecture: An Art for All Men. By Talbot Hamlin. New York (Morningside Hts.), Columbia University Press, 1947. 6 by 9¼ in. xvii + 280 pp. illus. $3.50.

A new book by Talbot Hamlin always is good news, particularly when it is, as is this, concerned with architectural interpretation. As the introduction points out, there has been no major volume on the subject since Mr. Hamlin's own *The Enjoyment of Architecture*, published some 30 years ago.

It is rather surprising to find this book announced as a new edition of the earlier one: the entire text has been rewritten and brought up to date, a revision so extensive that the two volumes are alike only in basic theme and outline. Even the author's approach to his subject has been altered. "Understanding and appreciating architecture," he comments, "is no longer a mere matter of 'enjoyment'; it is a matter so deeply implicated in the tissue of our living that it should be as much a part of our lives as is a basic understanding of politics or economics."

Architecture, Mr. Hamlin declares, is the one art with which everyone comes into daily contact. Yet it is one of the least widely understood and appreciated of all the arts. To help rectify this situation, here is what might well be termed the *story* of architecture. It is all here: its appeal, principles of construction and planning, style, interiors, the methods used by architects to achieve their desired effects, and so on. There is even a final chapter on community planning.

As usual, Mr. Hamlin has written in lively and interesting fashion. There is no "talking down" to his readers, though no previous knowledge of architecture is presumed. The layman reader will find himself theorizing and philosophizing along with the author, and before he has read very many pages he will be looking at the buildings around him with a much more appreciative and understanding eye. If he cares to delve further into the subject, there is provided a good list of books directly and indirectly concerned with architecture.

PRE-PLANNING SURVEY

County Town: A Civic Survey for the Planning of Worcester. By Janet Glaiyser, T. Brennan, W. Ritchie and P. Sargant Florence. London, W. 1, Eng. (50 Albemarle St.), John Murray, 1946. U.S.A. distributor, Transatlantic Arts, Inc., Forest Hills, N. Y. 6¼ by 9¾ in. xii + 320 pp. illus. $6.30.

The authors of this book are not town planners. You can thumb the pages in vain for a single map of proposed park areas or diagram of suggested superblocks, except for type studies. This is strictly a survey of existing conditions, prepared for the City Council of Worcester (a town of 53,000 population in the English Midlands) by the Commerce Department of the University of Birmingham. Actual redevelopment plans will be drawn up by Minoprio and Spencely, architects and planners. This division of labor is one of several features of the Worcester project worth consideration by American planners.

Worcester is good material for a specimen study in both town and regional planning because of its balanced economy as an industrial town surrounded by farms, and its close relationship with other industrial towns. A useful method has been worked out for defining regions according to physical features, population, traffic and economic structure.

The survey recommends new industries as a means of attracting new citizens and of carrying out the national policy of decentralization. In the matter of zoning, *accessibility* is stressed as well as segregation, and some interesting dia-

(*Continued on page 30*)

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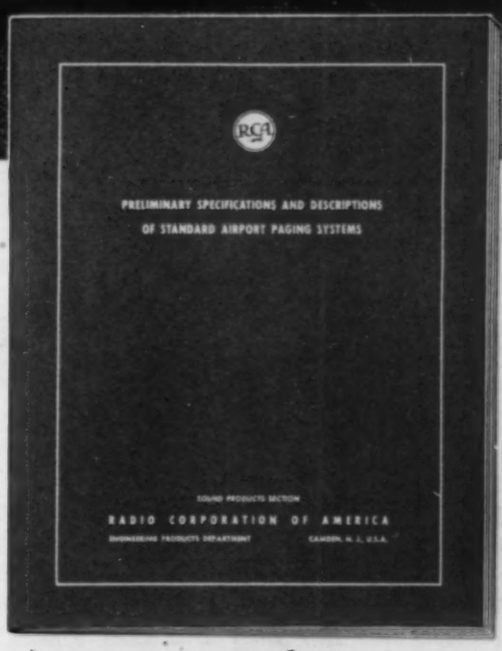

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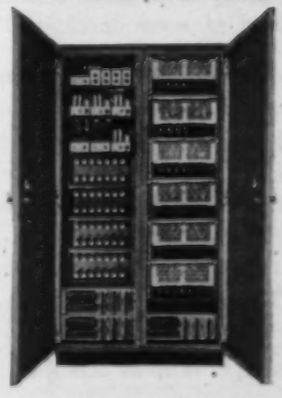
We will be pleased to send you a copy of "PRELIMINARY SPECIFICATIONS AND DESCRIPTIONS OF STANDARD AIRPORT PAGING SYSTEMS"—without obligation of course. Ask for Form No. 1798. Write for it—NOW!



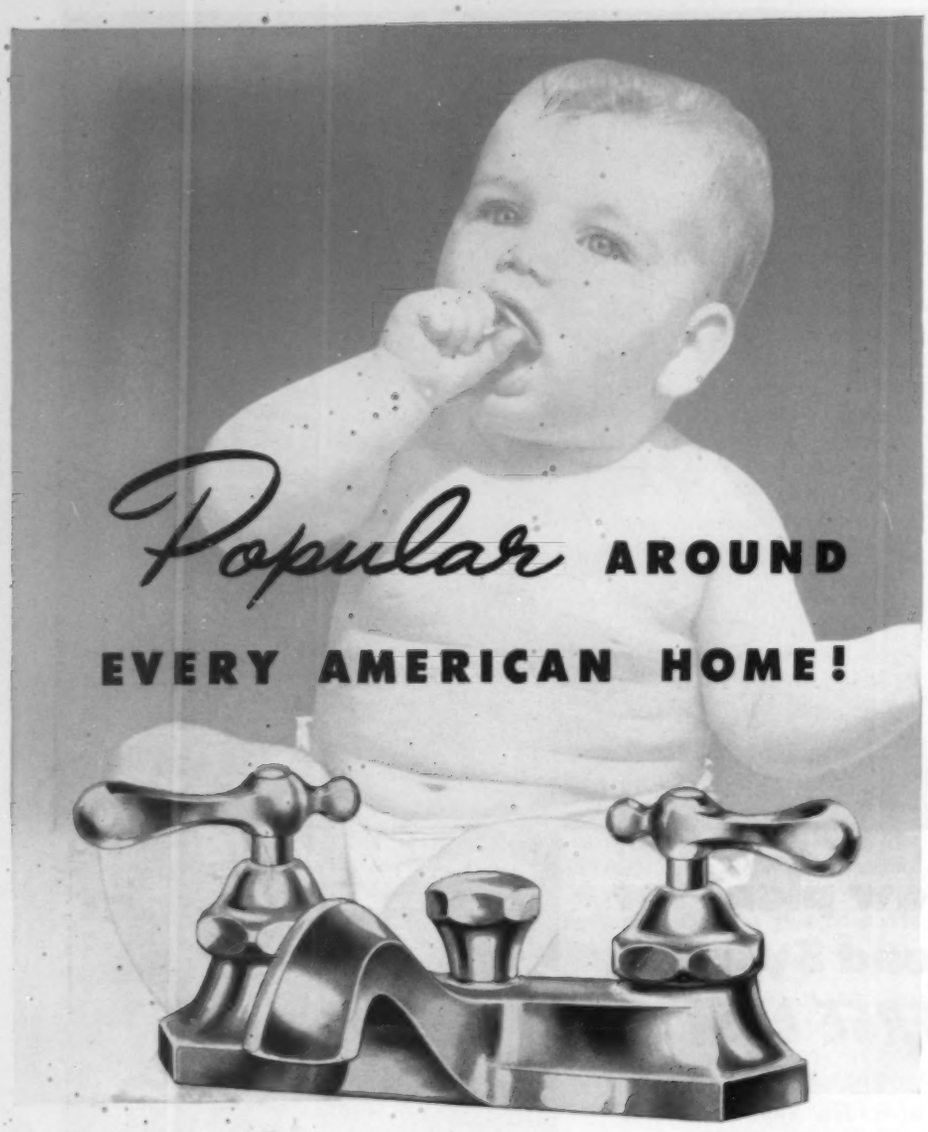
Typical RCA Airport Paging System with standardized control and power racks assembled in cabinet. With this type of design the sound system can be easily and quickly expanded or contracted.

SOUND SYSTEMS

RADIO CORPORATION of AMERICA

ENGINEERING PRODUCTS DEPARTMENT, CAMDEN, N.J.

In Canada: RCA VICTOR Company Limited, Montreal



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During 1947 many new and improved fixtures with exclusive Salter features will also be introduced. To assist you in specifying Salter Masterpiece appointments, write today for our new catalog, describing the complete Salter-Glauber line of quality plumbing fixtures.

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MASTERPIECES IN BRASS
10 Ninth Street, Marysville, Ohio
and division THE GLAUBER BRASS MFG. CO., *Kinsman, Ohio*

REQUIRED READING

(*Continued from page 28*)

grams have been made of the present dispersion of services in relation to population.

The book is well edited for quick reading and ready reference, with a summary of findings at the close of each chapter and a final summary of recommendations.

HEATING MANUAL

Radiant Heating. By T. Napier Adlam. New York 13 (148 Lafayette St.), The Industrial Press, 1947. 6 by 9 in. 472 pp. illus. $6.00.

Engineers and architects will welcome this manual on radiant heating, radiant cooling and snow melting. Its approach is direct and practical, its coverage broad enough to include all necessary information on the design, installation and control of hot water, steam, warm air and electric radiant heating systems, and to discuss in detail the related subjects of radiant cooling and snow melting by embedded pipes. Among the 309 illustrations are 64 full-page charts for determining pipe size and spacing for as many types of floor and ceiling construction.

Introductory chapters cover the development of heating methods, the theory of heat radiation, the relation of artificial heating to body heat losses, and the measurement of comfort. There are tables of heat transmission coefficients for various types of construction, of outside design temperatures in key cities in each of the 48 states, and of conductivities of building materials. A final chapter summarizes the exact step-by-step procedure in designing and installing radiant heating systems.

ON THE CARPET

The Rug and Carpet Book. By Mildred Jackson O'Brien. New York 16 (114 E. 32nd St.), M. Barrows & Co. Inc., 1946. 6 by 9 in. 166 pp. illus. $2.50.

Here is a book that will enable the most timid consumer to enter the rug department with a firm step and head held high. Mrs. O'Brien provides her readers with a lively history of rug making from antique oriental to modern American, a complete vocabulary of weaves, textures, materials and patterns, and sound advice on quality, price and how to avoid being fleeced.

The information is drawn — or "persistently pried," as the dedication states — from the author's husband's 25 years of research and experience in the rug and carpet business, but the advice is from Mrs. O'Brien's own experience as a housewife. There are diagrams of carpet knots and cross sections of weaves, but there are also paragraphs on sweeping, removing ink spots and choosing carpets that will be cat-resistant.

ARCHITECTURAL

RECORD

THROUGH WORDS TO WORKS

It is good to confer, good to convene. It is good to exchange ideas, to be exposed to the ideas of others. It is especially good to come to know men as persons as well as to know them as exponents of particular philosophies, theories, or practices. One's opinions of men change as well as one's opinions of their opinions. One learns to evaluate the sincerity and depth of a man's thought and feeling, to weigh what a man is in the light of what he says he believes, to judge his motives as well as his protestations. Informal group and man-to-man discussion contributes as much as public debate in open sessions. It is good, for it reaffirms one's faith in his profession and its future, in his colleagues, and in himself.

The recent Bicentennial Conference at Princeton proved this. The coming A.I.A. Convention at Grand Rapids will confirm it. The success of the Princeton Conference was due in large measure to the care with which the agenda was prepared, the high plane established at the outset, centering the discussion on the philosophical basis of design in relation to human progress in the control of environment. I commend to your attention, and for your contemplation, the thoughts expressed in the brief excerpts of statements made (pages 98 to 100). Fragmentary as they are and ripped from the context, each is a subject or a point of view worthy of consideration and development in your own mind and in discussion with others.

If there was one thought that threaded its way through the pattern of the Princeton discussions it seemed to be the general conviction that architecture and design must transcend physical objectives and serve man's spiritual needs, using all that science and engineering can provide but shaping them in terms of human values. Emphasis was placed thus on architecture as an *art*, with engineering as a means to an end rather than an end in itself. This is reassuring to the architectural profession which felt itself threatened by a more materialistic or mechanistic philosophy so prevalent but a few years ago. There was no formalized detailed expression of this belief in the true function of design, but it does indicate the direction of the current philosophy of many leaders in the field.

But there are other functions of other conferences and conventions. Paramount among them now is perhaps the consideration of ways and means to make that philosophy effective in practice, getting down to the question of *what* and *how*. It is heartening to find that this year the A.I.A. is undertaking seminar conferences directed to these ends, a procedure we have long and publicly advocated. Developed as they can be, and we hope will be, in future years, these features of A.I.A. conventions can be most rewarding both to the profession and to the public it serves. And some day the public will become aware of, and will appreciate, both the motives and the philosophy of the design professions through the excellence of their works. Only through the physical manifestations will the public become aware of the philosophies expounded and developed in conferences and conventions.

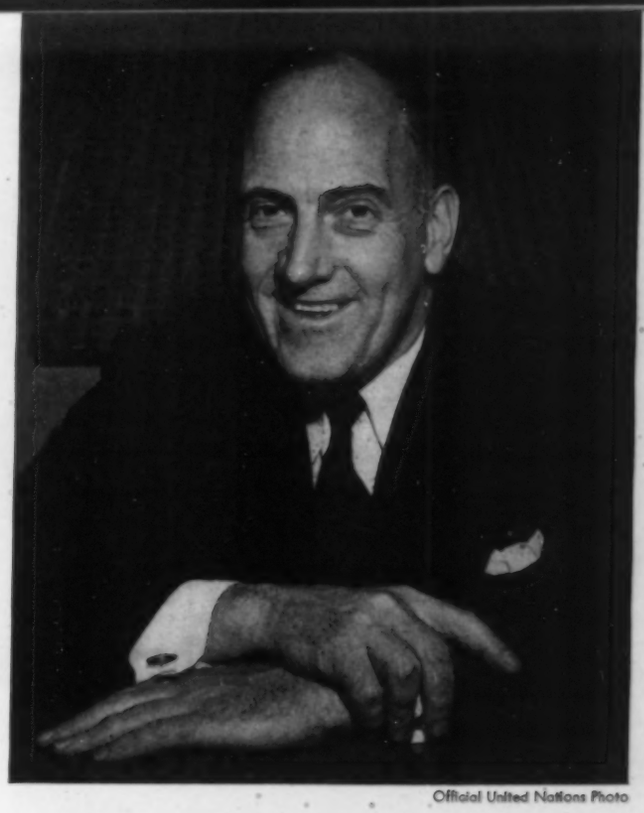
Kenneth K. Stowell

EDITOR

PLANNING FOR PEACE

Plans for United Nations Headquarters proceed on wartime speed schedules

Fairchild Aerial Surveys Photo



Official United Nations Photo

Wallace K. Harrison, Director of Planning

PLANNING for peace is fully as frantic in the RKO Building in Rockefeller Center, as any planning of war plants or military bases. Architects, associates, advisers, engineers, draftsmen, renderers, model makers, are all bent over boards with an air of urgency that might well be emulated in the meeting rooms being planned.

The designers feel that the whole effectiveness of United Nations might hang on the rapid completion of the permanent headquarters buildings. As one of them said, "Nobody has had the time or inclination to think of this as a great opportunity for grandiose exhibitionist schemes. There is no monument-to-architectural-genius self-consciousness, which would probably defeat itself anyway. We must do good workable buildings, in a mighty hurry. And I have an idea most great work of the past was done in just that spirit."

The parallel with wartime planning is striking. The Director of Planning, with authority of the Secretariat and the Headquarters Commission, preempts architectural talent just as our own government did. Work started weeks ago, long before the team was assembled. New players from here and abroad are called and sent into the game whenever they can be used at the field. The associate architectural firms are called upon to supply selected draftsmen on demand, and at cost. The Director of Planning, Wallace K. Harrison, does not have an architectural commission — he works on an annual salary, a surprisingly modest one. Indeed as yet there isn't even any appropriation covering design and construction; nobody has a dollar to spend. But, as in wartime, there isn't time to wait on such formalities. The engineers have their own conferences in a stripped apartment in the Marguery Hotel, have installed their own draftsmen there. Site borings have already been made. A liaison group has been set up with City bureaus, plans are being drawn for rearranging traffic routes, covering over or widening streets, moving the through drive along the East River, and so on. Material suppliers and labor leaders have been contacted, have promised a continuous flow of work.

Space requirements and groupings were worked out last year, before the site was chosen. These have been restudied and shaken down, are now fairly precise. (See pages 76 to 79.)

Planning work started with the three principal types of meeting rooms: general assembly, conference and council rooms. First assignment for architects was the development of dozens of alternate schemes for the disposition of delegates, advisers, interpreters, stenographers, press, radio and public (see page 81). The large meeting rooms will not, however, be the first built. The latest program calls for one building on an advanced time schedule, this to be "an efficient and functional" office building which would provide office space for the Secretariat and would include a few of the smaller conference rooms, but not the assembly or council chambers.

Three times schedules have been formulated: (1) "normal," calling for full completion in 1950; (2) "accelerated," completion in fall of 1949; (3) "maximum accelerated," which would get the office building done by fall, 1948. Architectural plans are called for in four months, to be ready for distribution to member nations in time for consideration by the General Assembly next September.

This might be contrasted with the record of the League of Nations palace at Geneva, which was handled through an architectural competition. The competition began in March, 1926; submissions did not meet requirements, nine equal first prizes were awarded.

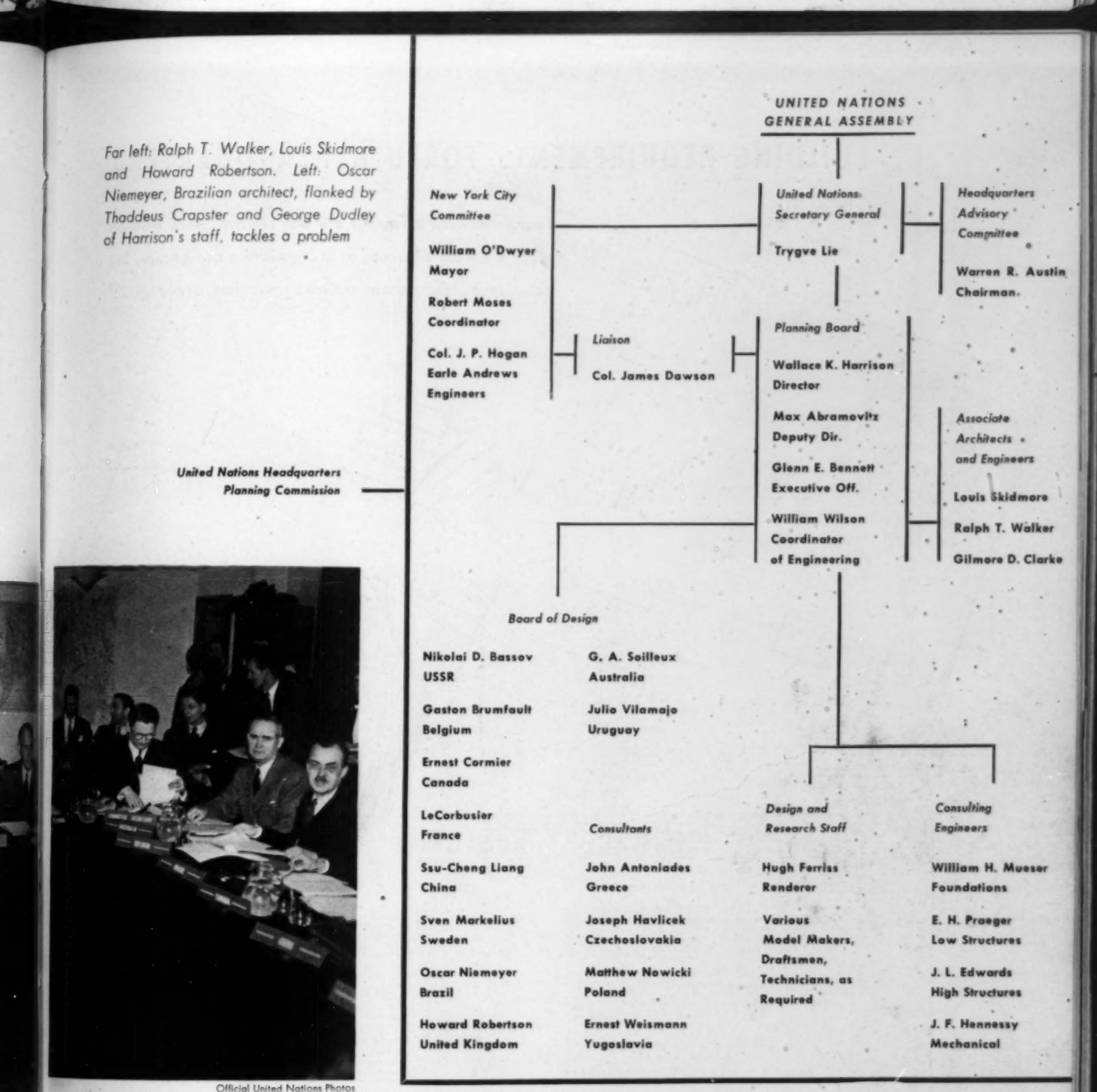
Finally diplomats took over the contest, chose four of the most orthodox schemes, asked that new plans be drawn. Almost two years had gone by. The foundation stone was laid a year and a half later, with final completion *12 years* after the competition began.

This time peace headquarters cannot develop so deliberately. Speed here might make all the difference. Well, it isn't waiting. It is being done by architectural firms with plenty of skyscraper know-how, and 14 consultants to supply imagination and viewpoints from as many foreign lands. If the UN builds its peace on as sound a basis as its buildings, and on a comparable "maximum accelerated" schedule, perhaps the world may begin to relax.

Far left: Ralph T. Walker, Louis Skidmore and Howard Robertson. Left: Oscar Niemeyer, Brazilian architect, flanked by Thaddeus Capster and George Dudley of Harrison's staff, tackles a problem

United Nations Headquarters Planning Commission

Official United Nations Photos

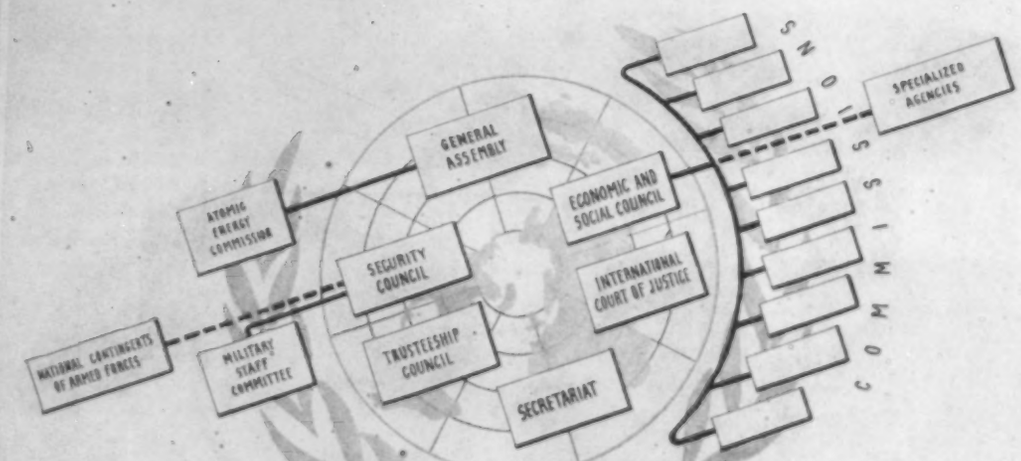


Left center: The early three of the architectural advisory group, with Wallace K. Harrison: left to right: LeCorbusier, N. D. Bassov and Howard Robertson. Center: a meeting of the Headquarters Advisory Committee; at the center table: Trygve Lie, Warren R. Austin, Harrison and Glenn Bennett. Lower left: a typical session of advisory architects and associates. Right: Robert Moses addresses a meeting on plans for the city's improvements near the site

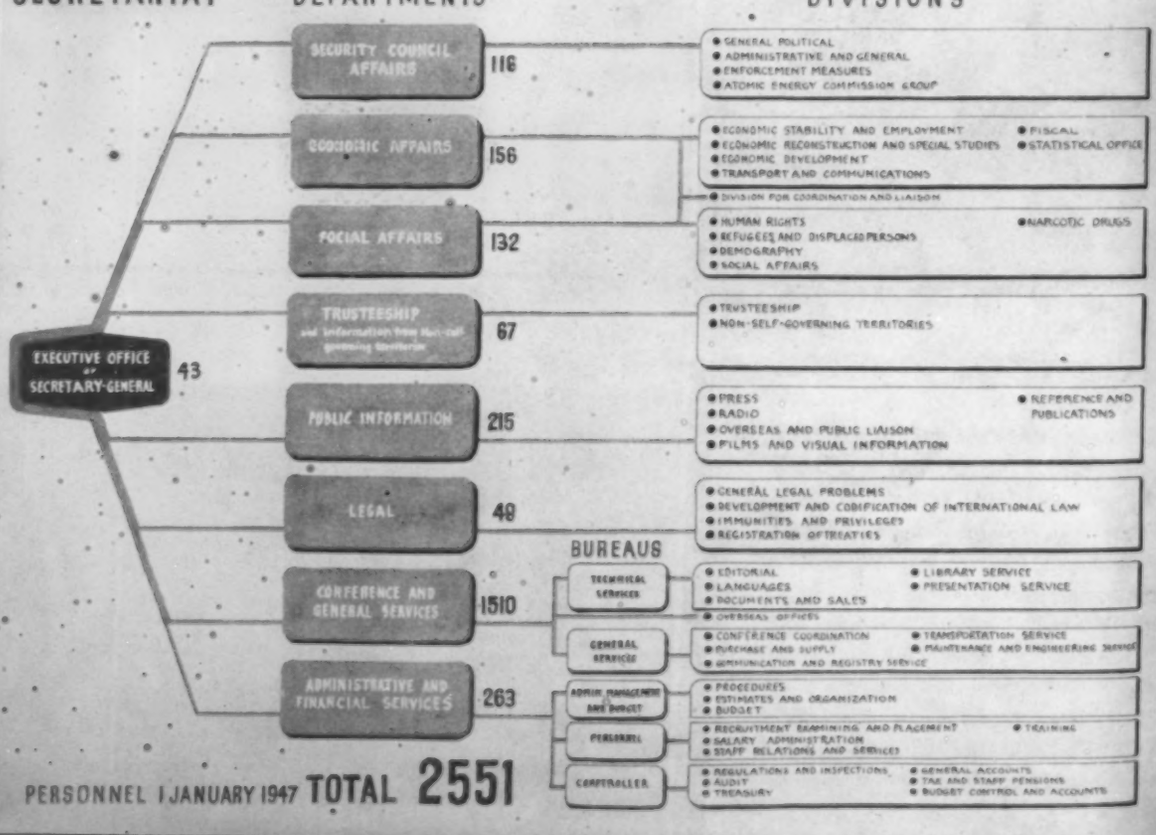
BUILDING REQUIREMENTS FOR U N HEADQUARTERS

Formulated even before the site was selected, these data on space needs are still sound as to organization and function, but actual space allocations have since been revised, as on page 79

PRINCIPAL ORGANS

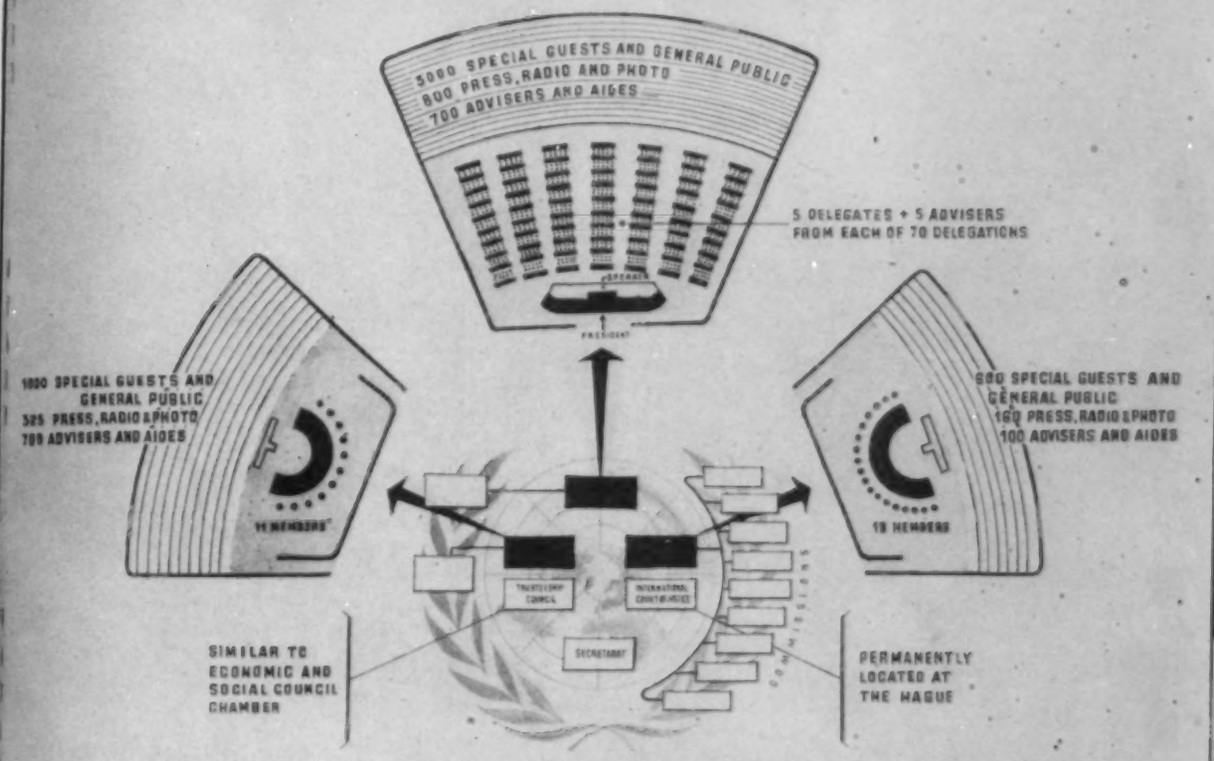


PERMANENT RESIDENT PERSONNEL



OFFICIAL BUILDING REQUIREMENTS

MEETING HALLS


3000 SPECIAL GUESTS AND GENERAL PUBLIC
800 PRESS, RADIO AND PHOTO
700 ADVISERS AND AIDES
5 DELEGATES + 5 ADVISERS
FROM EACH OF 70 DELEGATIONS
1000 SPECIAL GUESTS AND GENERAL PUBLIC
525 PRESS, RADIO & PHOTO
700 ADVISERS AND AIDES
11 MEMBERS
800 SPECIAL GUESTS AND GENERAL PUBLIC
150 PRESS, RADIO & PHOTO
100 ADVISERS AND AIDES
19 MEMBERS
SIMILAR TO ECONOMIC AND SOCIAL COUNCIL CHAMBER
PERMANENTLY LOCATED AT THE HAGUE

TYPICAL COMMITTEE ROOM
SEATING 400

ADDITIONAL REQUIREMENTS FOR MEETING HALL AREAS

	GENERAL ASSEMBLY	SECURITY COUNCIL	ECONOMIC & SOCIAL COUNCIL (TRUSTEESHIP COUNCIL SIMILAR)
COMMITTEE ROOMS	7 SEATING 400 10 SEATING 60	8 SEATING 120	10 SEATING 120
DELEGATES OFFICES	15 SUITES FOR 8 PERSONS	11 SUITES FOR 8 PERSONS	18 SUITES FOR 8 PERSONS
OTHER MAIN OFFICES	SUITES FOR: PRESIDENT 7 VICE PRESIDENTS SECRETARY-GENERAL EXECUTIVE OFFICER	SUITES FOR: PRESIDENT ASSISTANT SECRETARY-GENERAL OFFICES & SUITES FOR: MILITARY STAFF COMMITTEE ATOMIC ENERGY COMMISSION ONE OTHER COMMISSION COMMITTEE OF EXPERTS	SUITES FOR: PRESIDENT 2 VICE PRESIDENTS 2 ASST. SECRETARIES-GENERAL OFFICES & SUITES FOR: OFFICERS OF 15 COMMISSIONS AND SUB-COMMISSIONS

CENTRALIZED OR SEPARATE SERVICES FOR ALL MEETING HALLS

SECRETARIAT	OTHER SERVICES	PRESS	MISCELLANEOUS
INTERPRETERS VERBATIM-REPORTERS TRANSLATORS DOCUMENTS SECURITY BUILDINGS MANAGEMENT PUBLIC INFORMATION BOOTHS & STUDIOS FOR: RADIO, FILM PHOTOS, TELEVISION SIMULTANEOUS INTERPRETATION BOOTHS SOUND CONTROL BOOTHS SOUND RECORDING ROOMS	TELEPHONE STORAGE CLOAK ROOMS REST ROOMS	CENTRAL WORK ROOM WIRE & CABLE SERVICES OFFICES FOR 20 NEWS SERVICES 50 NEWSPAPERS	EXHIBIT AREAS DELEGATES LOBBY & LOUNGE WITH BAR PUBLIC LOBBY PRESS LOBBY & LOUNGE WITH BAR

OFFICIAL BUILDING REQUIREMENTS OFFICES

SECRETARIAT

1 SECRETARY-GENERAL	1,500
8 ASSISTANT SECRETARIES-GENERAL	8,800
9 TOP-RANKING DIRECTORS	9,900
75 DIRECTORS OF DIVISIONS	52,500
100 OTHERS	70,000
300 SECTION HEADS	135,000
200 OTHERS	90,000
2400 EMPLOYEES	240,000
20 CONFERENCE ROOMS	2,500
2 AUDITORIUMS	12,000
RECEPTION AND LOBBY	8,000
REPRODUCTION, STORAGE, VAULTS, SHIPPING	100,000
PUBLIC COMMUNICATIONS SERVICES	4,000
BUILDING SERVICES AND REST ROOMS, DUCT SPACE	190,000
CIRCULATION (15% OF TOTAL)	114,000
	1,038,000 SQ. FT. = 96,534 m²

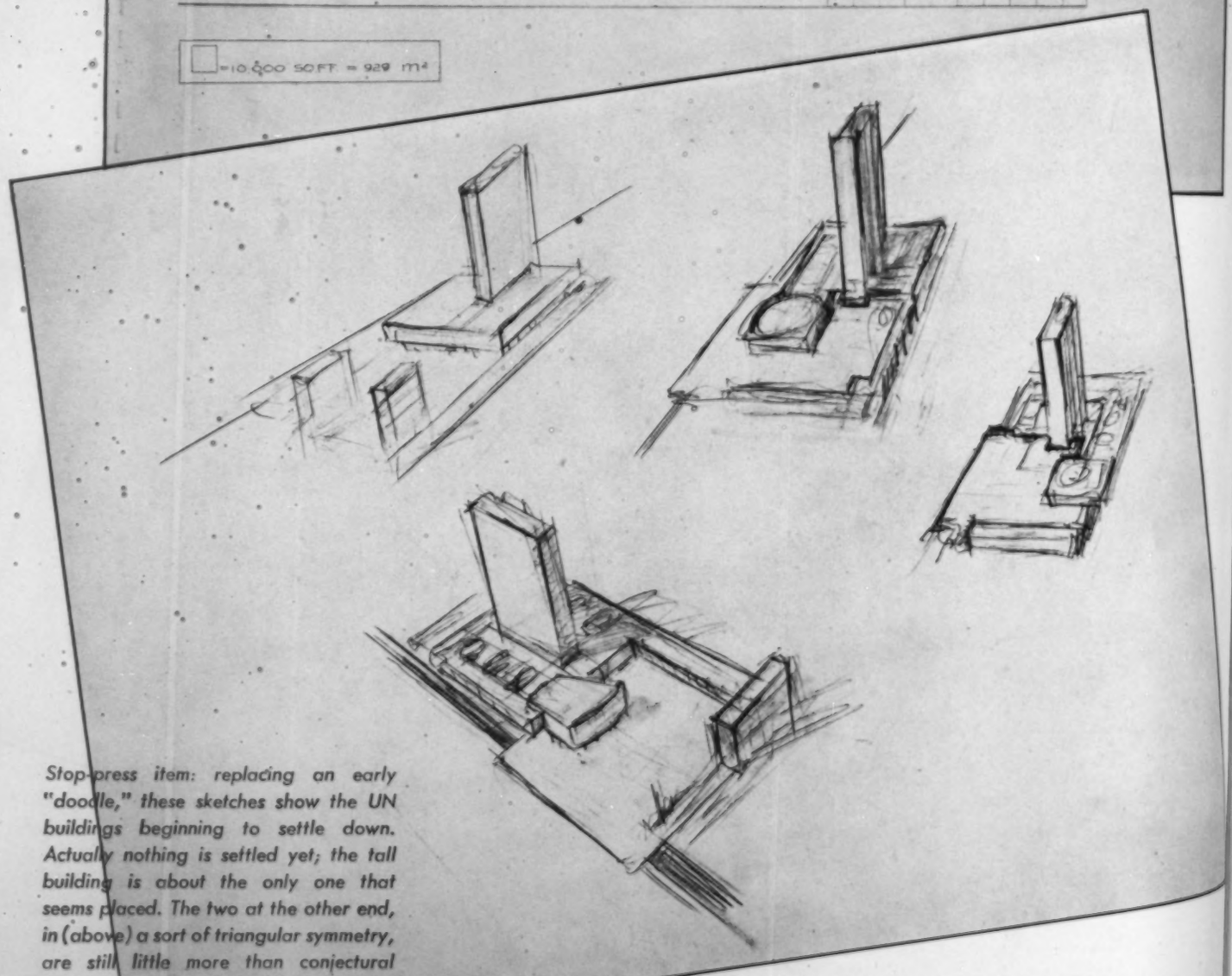
DELEGATIONS

25 MISSIONS, 2000 SQ. FT. EACH	50,000
25 MISSIONS, 8000 SQ. FT. EACH	200,000
15 MISSIONS, 12,000 SQ. FT. EACH	180,000
5 MISSIONS, 50,000 SQ. FT. EACH	250,000
	680,000 SQ. FT. = 65,240 m²

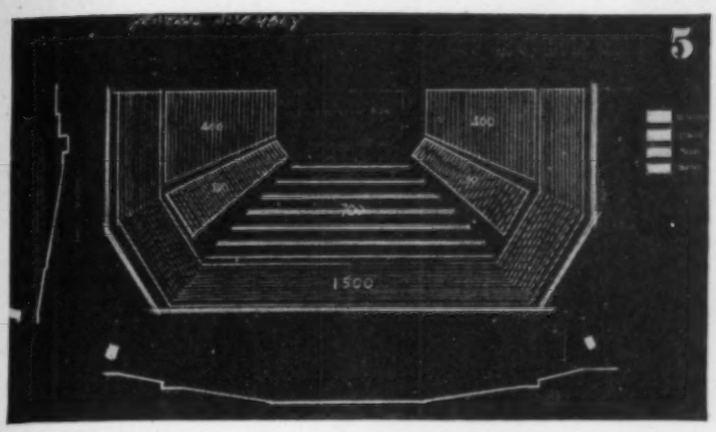
SPECIALIZED AGENCIES

6 AGENCIES, 250 PERSONS EACH 350 SQ. FT. PER PERSON. (SAME AS SECRETARIAT)	525,000
8 LIAISON OFFICES, 1750 SQ. FT. EACH	15,000
	540,000 SQ. FT. = 50,220 m²

□ = 10,000 SQ. FT. = 929 m²

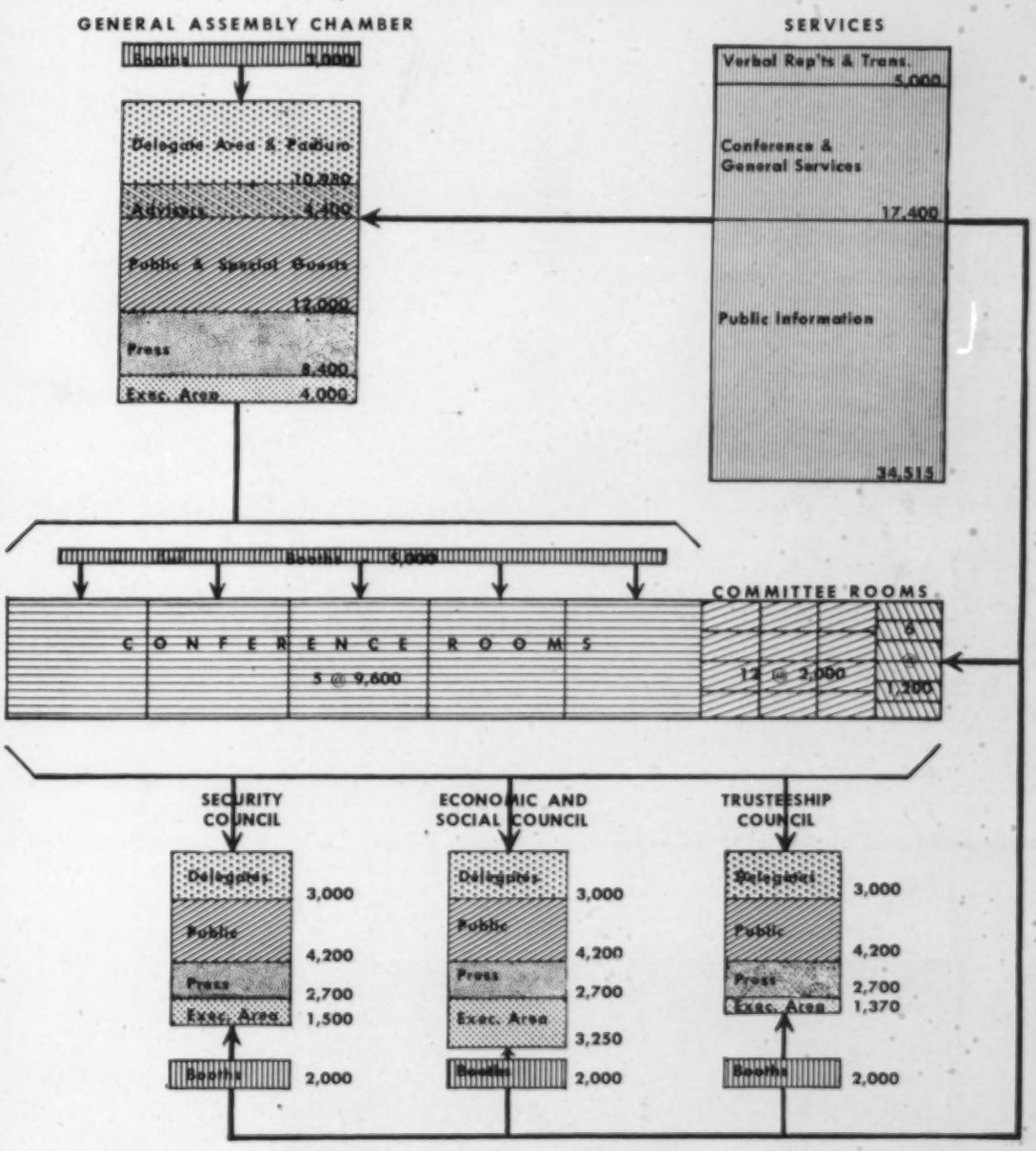


Stop-press item: replacing an early "doodle," these sketches show the UN buildings beginning to settle down. Actually nothing is settled yet; the tall building is about the only one that seems placed. The two at the other end, in (above) a sort of triangular symmetry, are still little more than conjectural



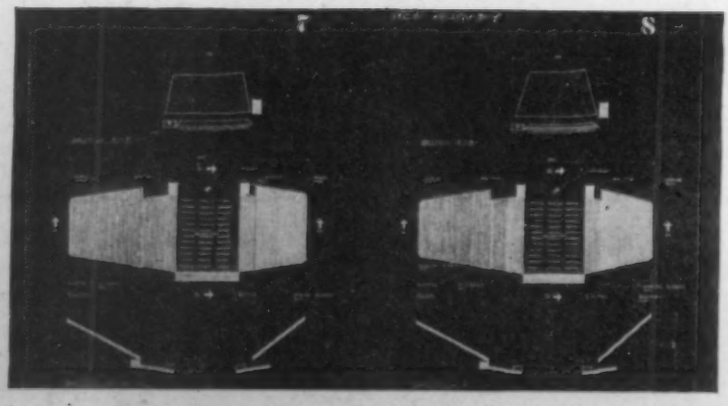
U N MEETING HALL AREAS, NOW "JUST ABOUT RIGHT"

(all areas in sq. ft.)

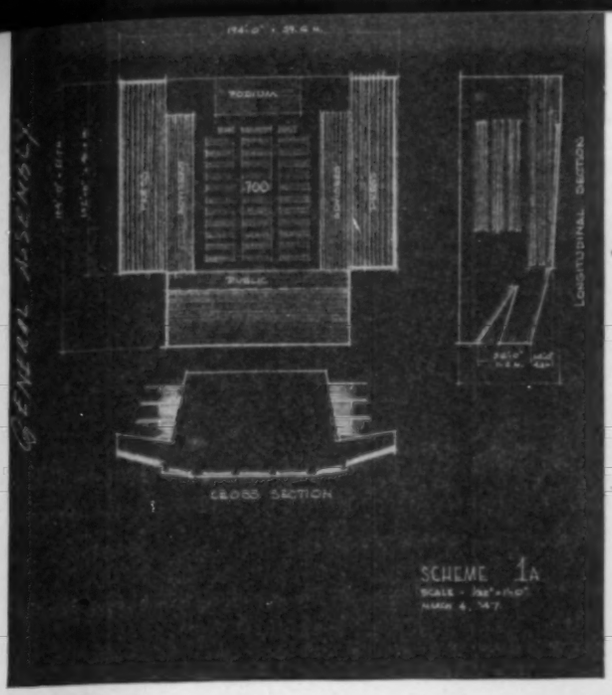


Hugh Ferriss, official renderer for U N staff

Max Abramovitz presides at a meeting of the engineers and planners. Gilmore Clarke, landscape architect, third from right

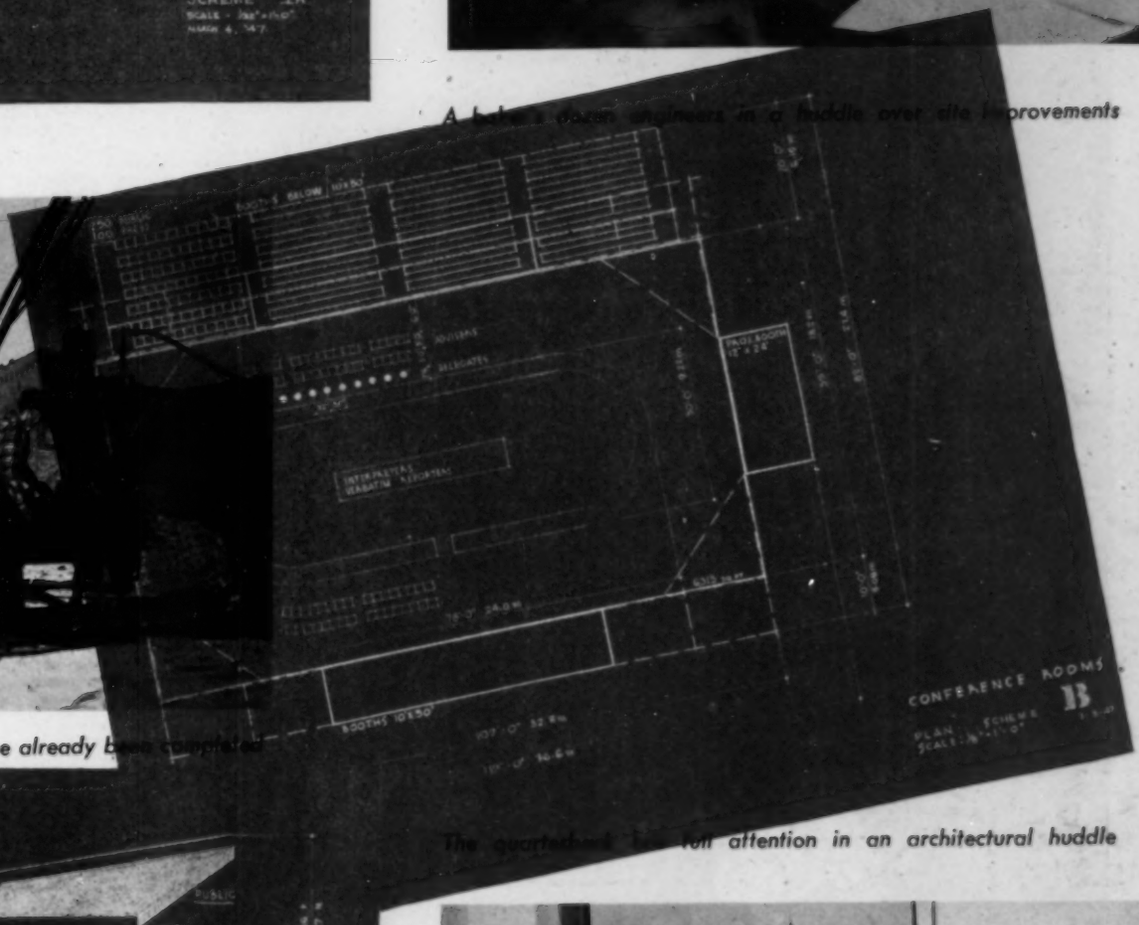


Drawings in blue are a sampling of dozens of schemes now being tried out for assembly room, conference rooms and council chambers

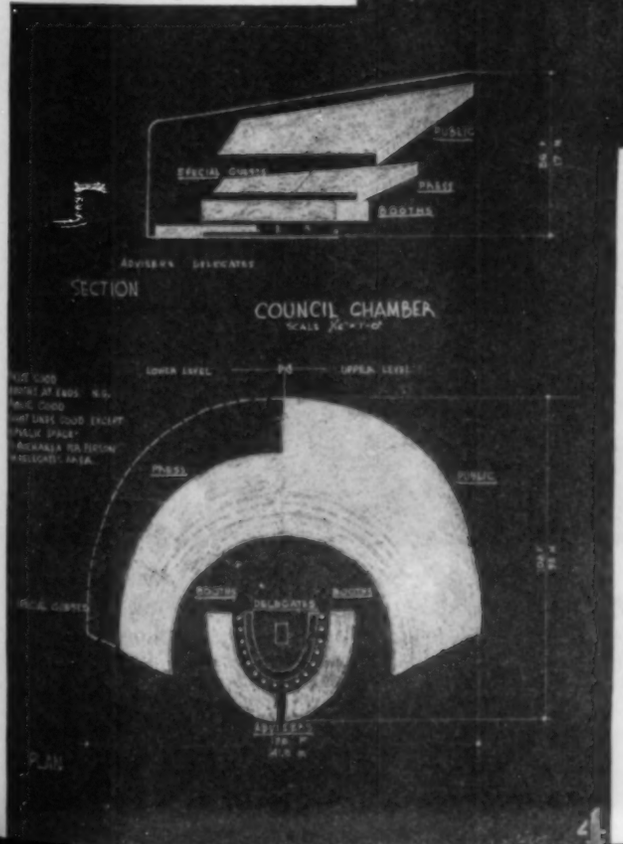


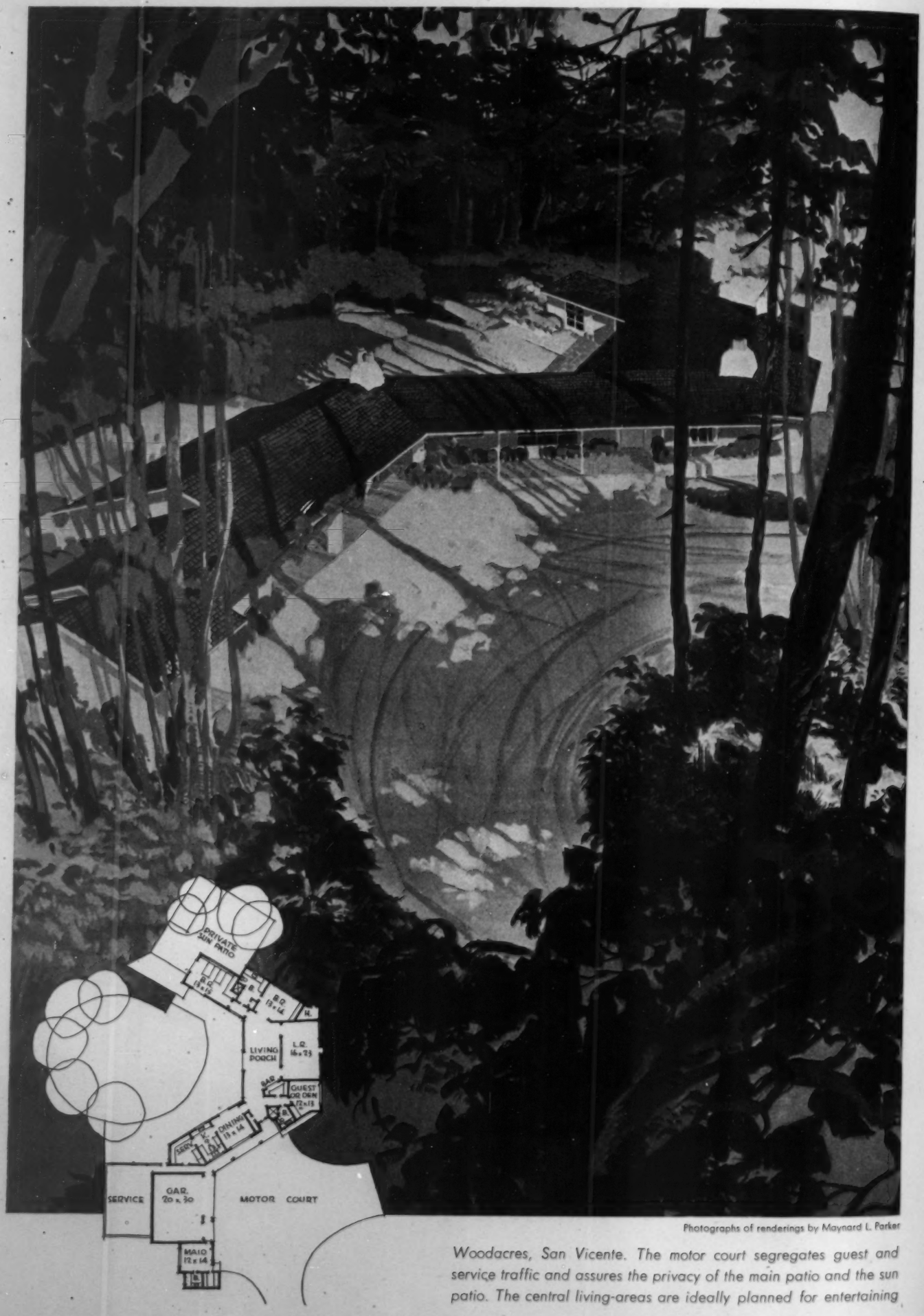
A half a dozen engineers in a huddle over site improvements

Test borings have already been completed



The quarterback has full attention in an architectural huddle





Photographs of renderings by Maynard L. Parker

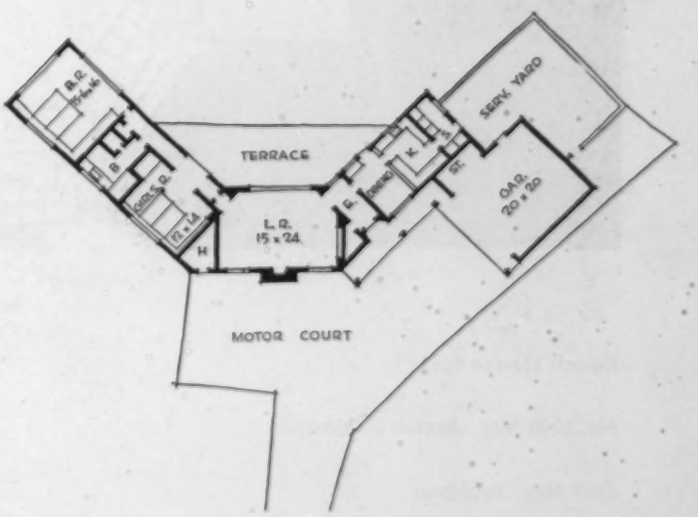
Woodacres, San Vicente. The motor court segregates guest and service traffic and assures the privacy of the main patio and the sun patio. The central living-areas are ideally planned for entertaining

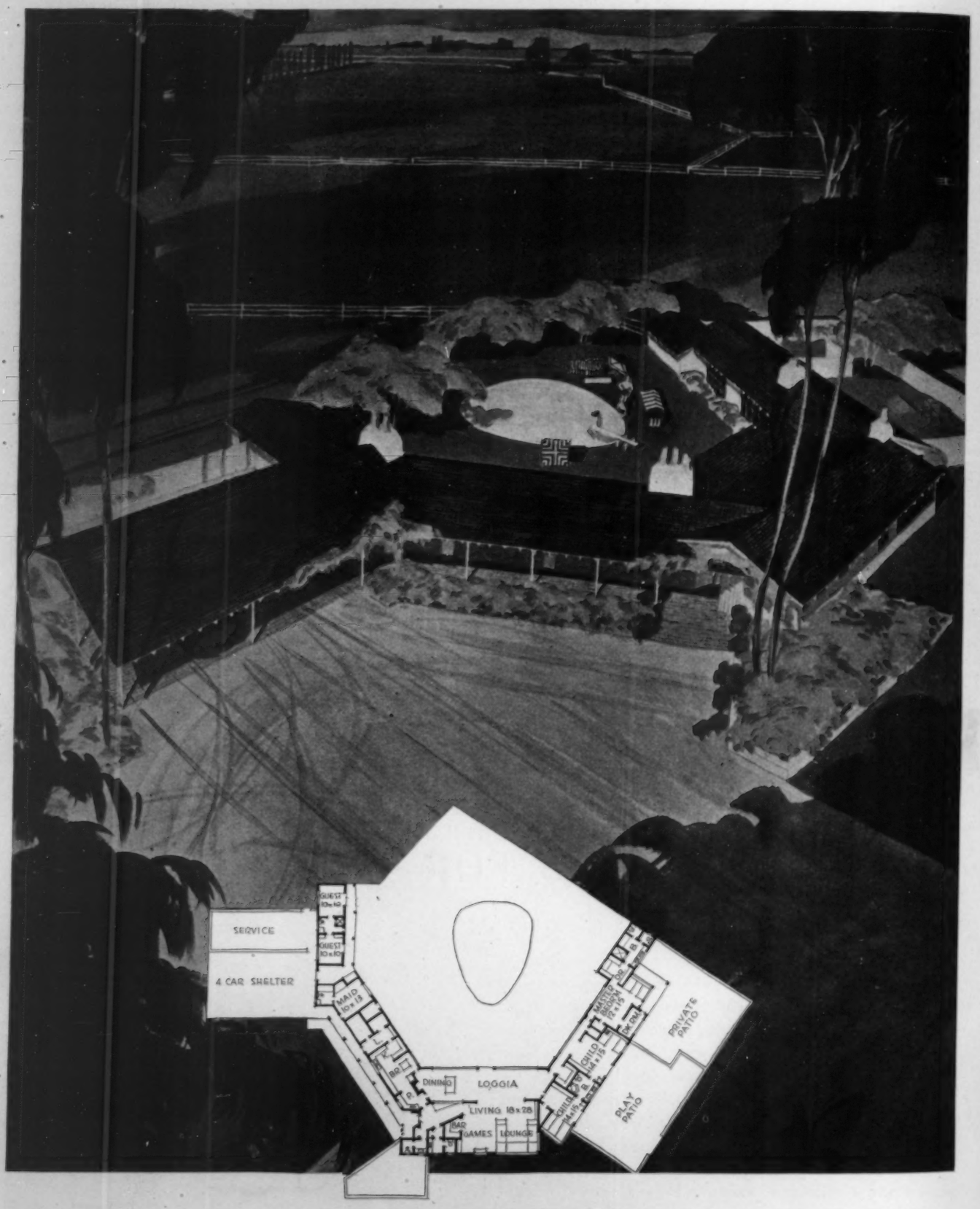
6 RANCH HOUSES FOR MODERN LIVING

Cliff May, Architect

VARIATIONS of a vigorous theme provide a symphony — in this case a theme of abundant living outdoors and in, with overtones of California sunshine and quiet shade. Here are six houses with a basic plan conception — a central living area with wings on both sides, one wing for services and one for personal rooms, an informal rambling type plan with pleasant angles. And the variations are significant in terms of the owners' requirements. The architecture is always gracious, utterly simple and unostentatious — a straightforward expression of plan and structure, wood frame with hand split shake roofs. Foundations are concrete slabs over a 6-in. rock cushion. Floors are wood, carpet, asphalt tile, linoleum, or stone, depending on the use of the room. Heating is usually forced warm air.

The house for Mr. and Mrs. Talton R. Craig, above, now nearing completion, commands a panoramic view of the San Fernando Valley.



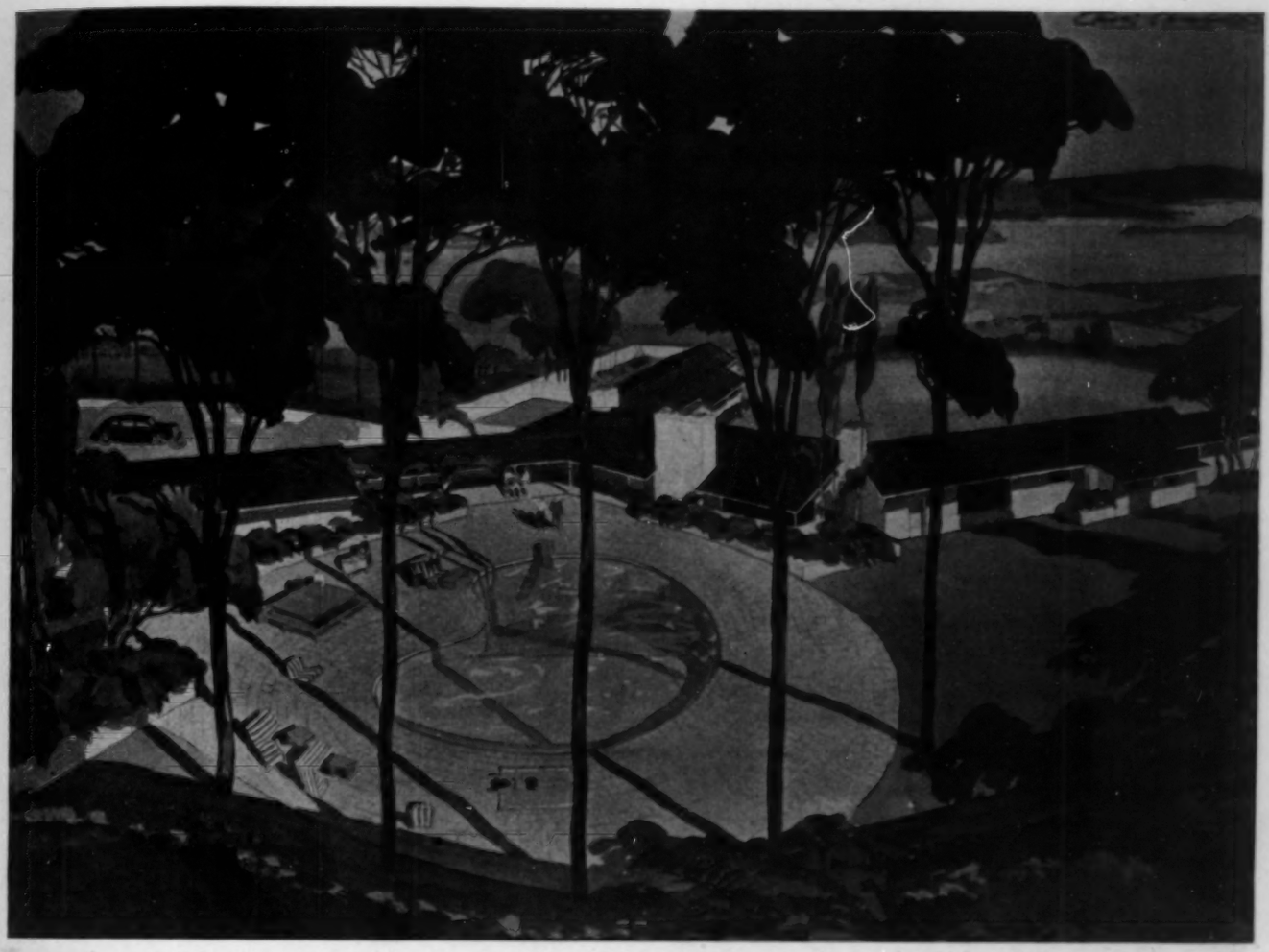


Ranch House for

Mr. and Mrs. James L. Maupin

Cliff May, Architect

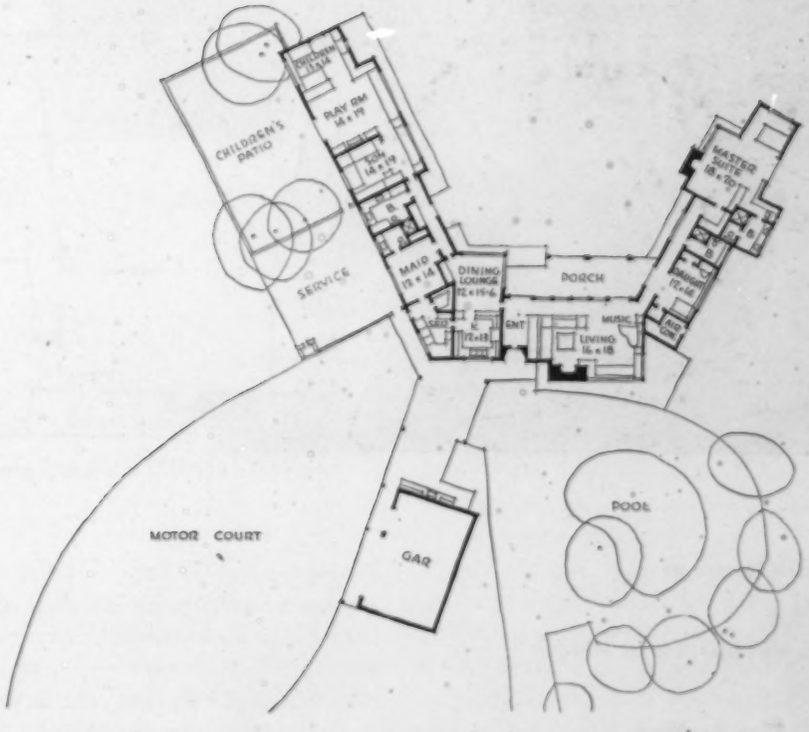
Informal hospitality is reflected in the plan of this Fresno ranch house, expressed so well in the truly functional arrangement of the living room and the dining loggia which are separated only by a sliding partition. The breakfast room, practically a part of the kitchen, is also available for informal snacks. Guests have their own wing opening on the patio



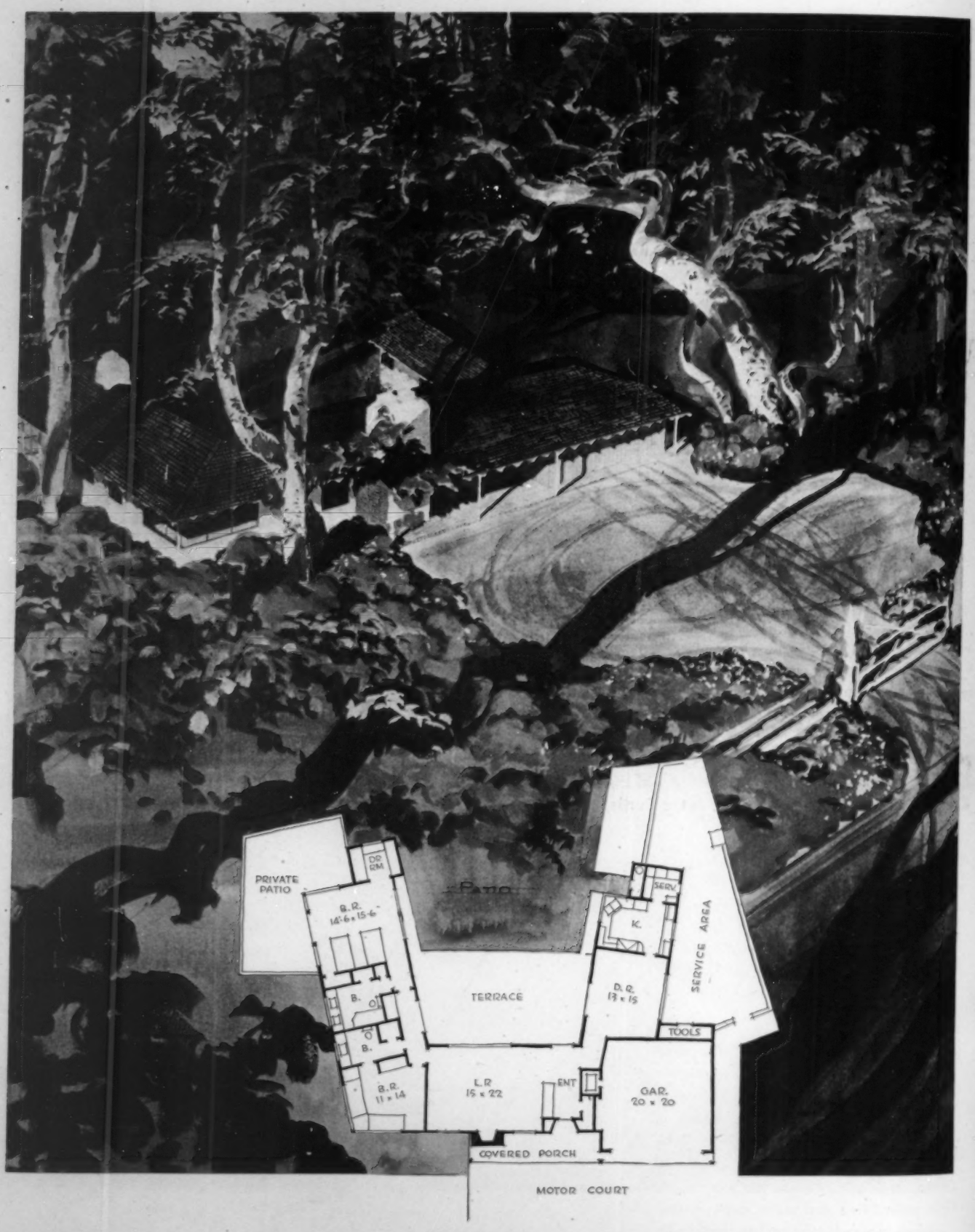
Ranch House of Mr. and Mrs. Jesse Curtis, Jr.

San Bernadino, Cal.

Cliff May, Architect



Provisions for four active growing children determined much in this plan. The three boys are in one wing with its spacious playroom and patio, the older son having his own room. The daughter's room is in the master-suite wing. The master bedroom itself is noteworthy for its large living area, so necessary when youth takes over the main living and music room. A convenient dining-lounge-kitchen contributes to the pleasures of informal hospitality. Motor court and swimming pool court are separated by the garage and spacious covered terrace while the main patio and living-porch overlook the expanse of the San Bernadino valley

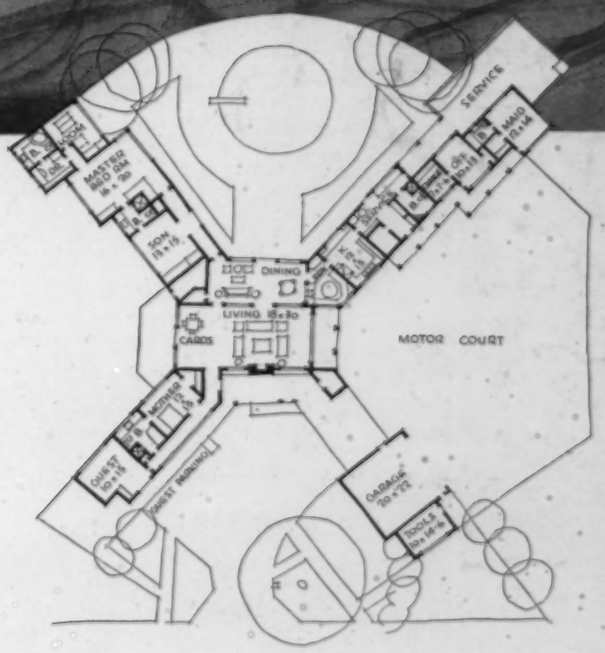


Ranch House of

Mr. and Mrs. Lloyd Aldrich

Cliff May, Architect

Proving that a ranch house can be compact without losing its character, this house was planned for a 100-ft. lot. The wings are but slightly splayed, embracing a rear patio-garden. The master-suite patio is surrounded by a seven-foot wall insuring privacy. The front bedroom is convertible into a den when the older son is away. Both the living room and the dining room open onto the broad terrace for ease in entertaining. Motor court and service area are well separated from the outdoor living areas by the house itself



Ranch House of

Mr. and Mrs. Sam Crowley

Cliff May, Architect

In contrast to the house on the opposite page, the site of this house is a 100-acre ranch, at Red Bluff in northern California at the foot of the Sierra Nevada Mountains. Three gigantic oaks enhance the beauty of the site and provide welcome shade. Since the view extends in every direction, an "x" plan was developed and one can enjoy the view on all sides from the central living area. The plan is logically divided to provide for the activities of each member of the family

LIGHT TELLS A MAGIC CARPET STORY

BIGELOW-SANFORD SHOWROOM, MERCHANDISE MART, CHICAGO

Donald Deskey Associates, Designers. Project Coordinators: Ralph G. Gulley, Charles H. Warner, Jr., Harold Leeds, Arthur Finn, Frank Wallis

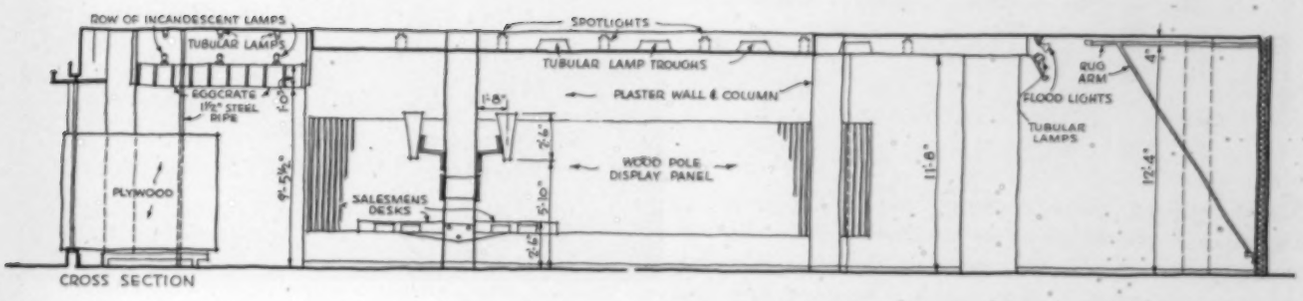
WHOLESALE show and sales requirements were the chief determinants in this design, providing large areas for display of the complete Bigelow-Sanford line. It is believed, however, that many of the features and devices can be adopted profitably by retailers, and to this extent the showroom is prototypic.

Here, as in most all effective display merchandising, lighting tells the biggest part of the story. And carpets, among all commodities, are near the top in exacting highest designer skill in applying the technique. In this case, standard units for the most part were used in seeking the proper mixtures of fluorescent and incandescent, to give uniformity over the broad carpet surfaces, insure minimum color distortion, and prevent "washing out" of widely varying pile textures. Greatest control is provided in the Contract Sales Room (see plan, page 91) where 12 switch combinations enable simulation of conditions from dim interior to outside daylight.

Hedrich-Blessing Studio Photos

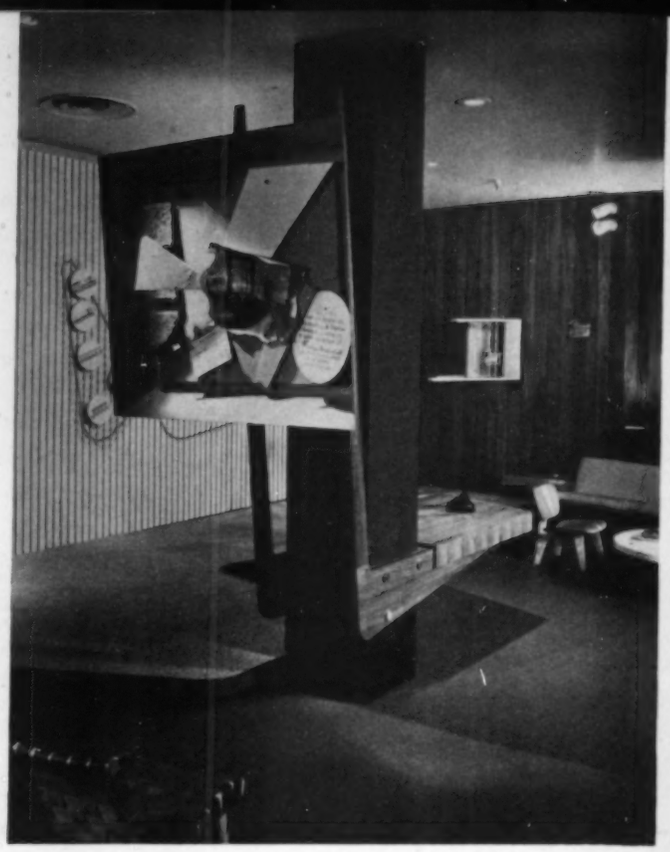
"Open-front" compulsion is manifest, though the showroom is located on an interior corridor of the Merchandise Mart. Front has terrazzo base with metal sill. Glass is trimmed with mat-finish chrome metal. Screen to left of door is walnut veneer plywood, natural finish; entrance push plate is wood, same finish

Show-window soffits contain conventional floodlights (not detailed in section). Along the ceiling above the egg crate are three fluorescent strips running continuously over the entire length. Fixed on the crate's top side are a number of 60 w. incandescent lamps, spaced 3 ft. on centers each way and planted in special "egg cup" fixtures (45° cut-off) which reflect to the ceiling for fluorescent mix. In the main area, incandescent floodlights (labeled "spotlights" in section) are 150 w., flush recessed; 4-tube, 40 w. each, fluorescent units are flush recessed and louvered. Combination is designed to give 45 fc. on each rug platform at an incandescent-fluorescent ratio of approximately four to one. Swivel socket adjustable reflector floodlights in rug arm alcoves are 300 w. each



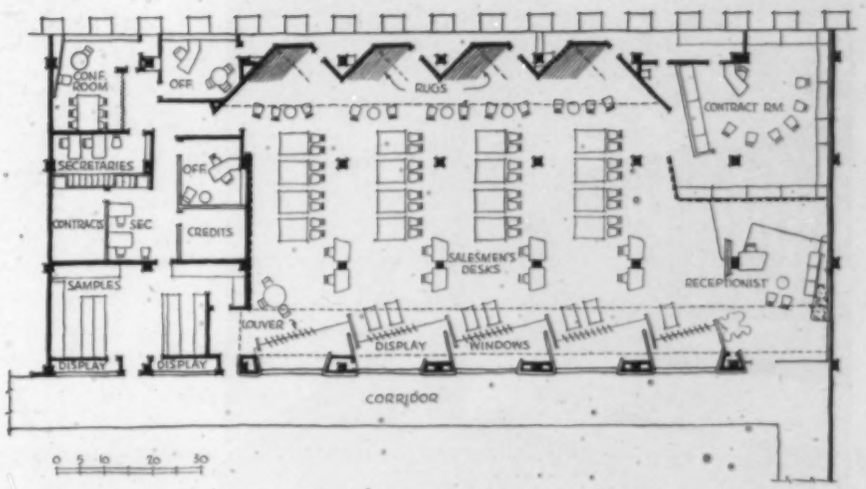
CROSS SECTION

Painted bronze display box, "balancing" the receptionist's desk, has a cork back for exhibiting various institutional eye catchers. All the cantilevered furniture is functional to the extent of permitting a less-cluttered broad sweep of Bigelow-Sanford carpet underfoot. Then, too, fixed desks are not subject to disharmonic shoving about by paleolithic salesmen

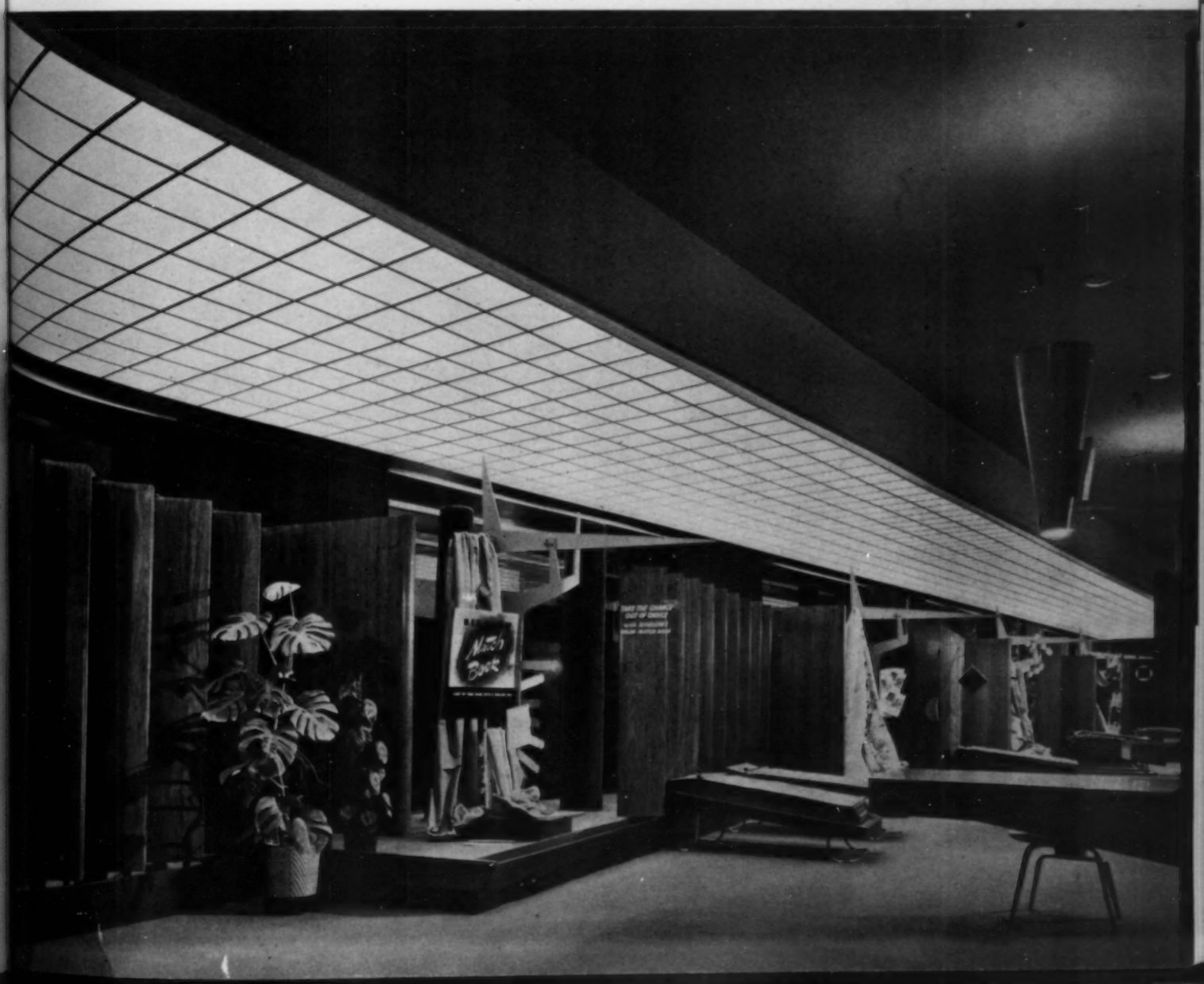


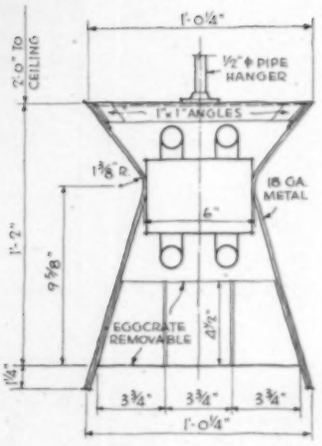
Below: Each alcove contains 29 rug arms, 58 rugs approximately 9 by 12 ft. Incandescent-fluorescent lighting from cove is supplied by 300 w. adjustable floodlights and standard tubular units (see section, page 89). There are 10 floods for each alcove and four 2-tube units, 4-ft. long; one, 3-ft. long. Five of the floods play across to one side of the "V"; five to the other; and are adjusted to give maximum uniformity on the rug surfaces, with minimum "pile washing." Alcove juncture points were designed to coincide with lines of columns for "framing" from the main sales area. Vistas framed by columns were also calculated elsewhere

Economy in the layout of office spaces may be noted in the plan, to permit utmost possible dimensions in the main selling areas. Measures for preventing cubicular claustrophobia in office regions may be observed on the next page

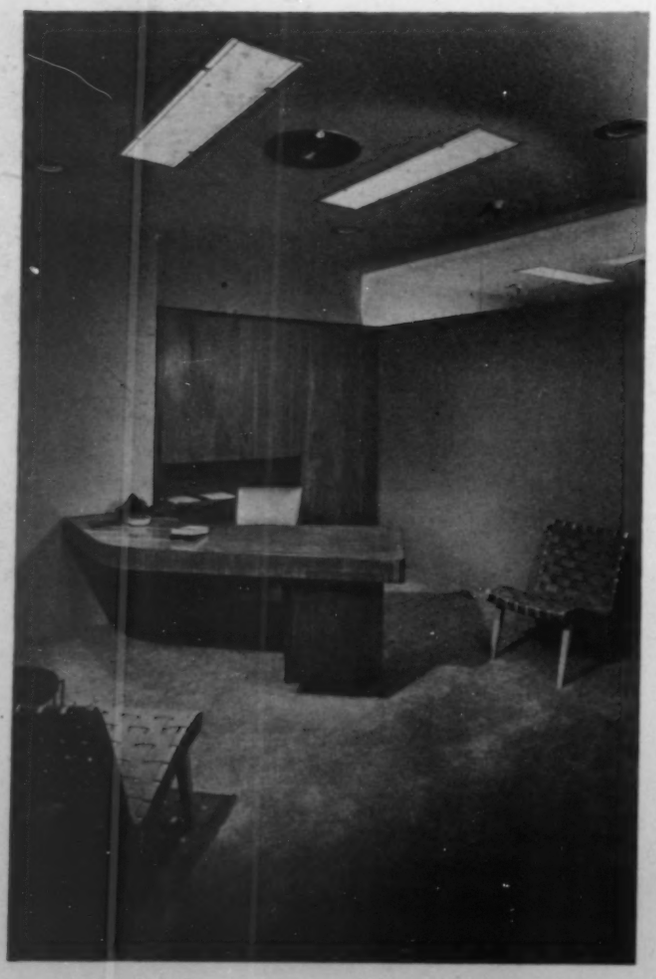


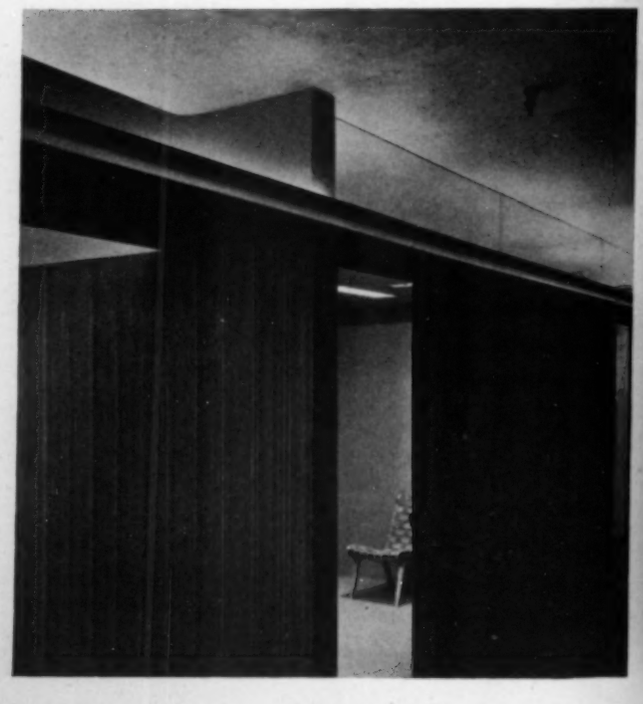
Both the plan and the photo below illustrate the use of pivoted fins as show-window backing, permitting varying amounts of through view, as desired, from both sides of the window display. Platforms are also equipped with stanchions for hanging rugs, and for screens to enclose the usually open platform corners. Fins like most of the showroom's woodwork have natural finish walnut veneer. In the egg crate, convenient sections are removable for lamp servicing. Also removable are baseboards to insure snug carpeting



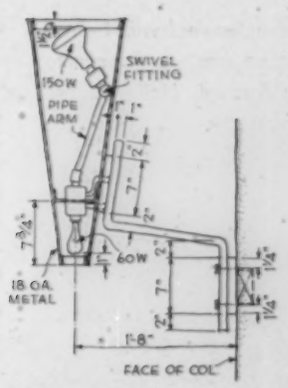


Lighting in the conference room, though very special, does not provide the wide range of combinations and control given elsewhere, since the needs are different. Fluorescent is used exclusively here, with four 2-tube open-end industrial units over the egg crate. The lowest part of the special fixture is 3 ft. 2¾ in. above the desk, to bring light exactly to the 4- by 8-ft. edges

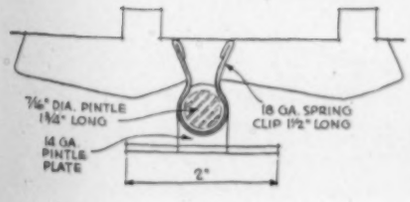


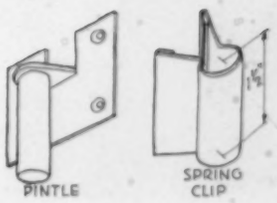


To allay possible claustrophobiac sensations in the minimal office spaces, partitions are topped with glass transoms to give ceiling spread. In photo above, striated plywood panel flanks corridor leading to main sales area. Lighting along top of front partition is by means of three continuous fluorescent lines, with reflector; there are four lines over entrance to the corridor



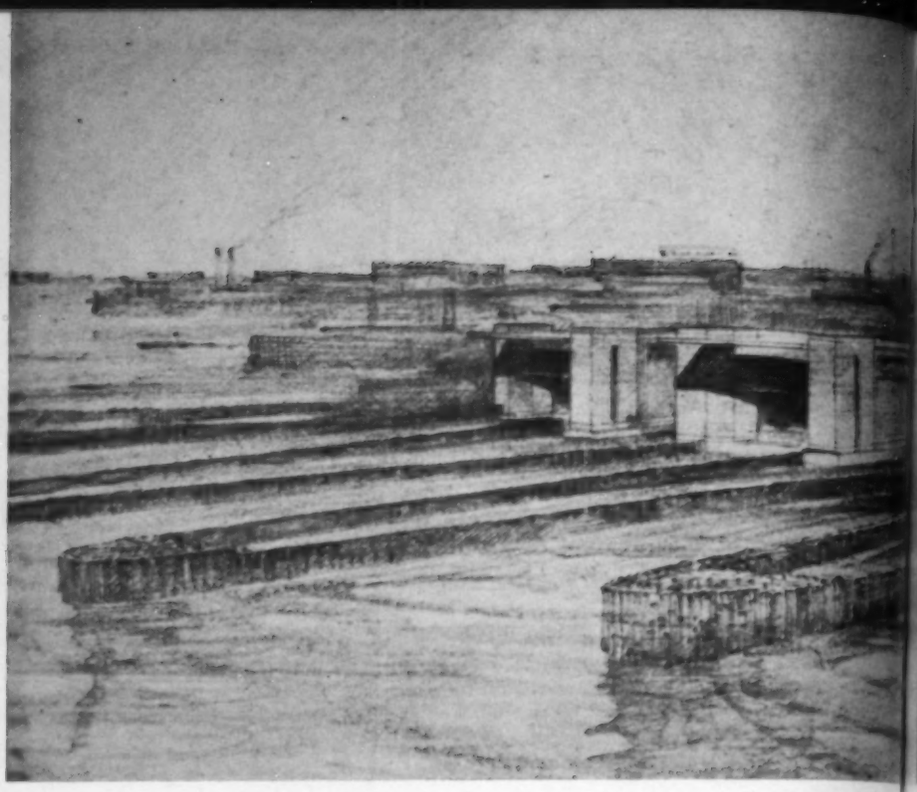
"Megaphone" fixtures above desks give glareless uniformity from the bottom over salesmen's working surfaces; from the top, provide supplement to lighting of main sales area. They are adjustable so that, to a degree, they may be thrown into incandescent-fluorescent combinations as needed. Background display screen is similar to that behind reception desk *(see p. 89)*





Details at left illustrate method of attaching changing displays to fireproofed wood-pole screens. 2000 w. duplex outlets permit wiring, concealed by pole angles, to pass up to lights on inner side of display. Screens are also spotlighted

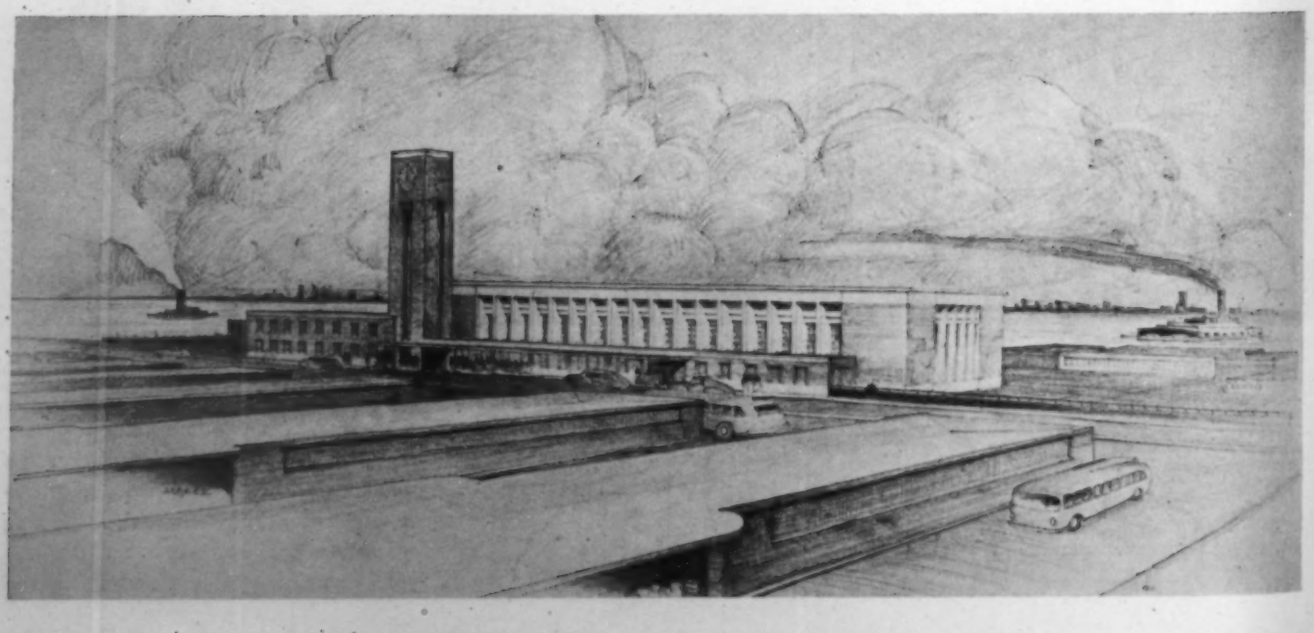
Exterior of the new terminal will be red brick with limestone trim, to harmonize with the existing Borough Hall structure directly across from the main entrance



TRANSPORTATION COORDINATED

Municipal Ferry Terminal, St. George, Staten Island, N. Y.

Madigan-Hyland, Engineers



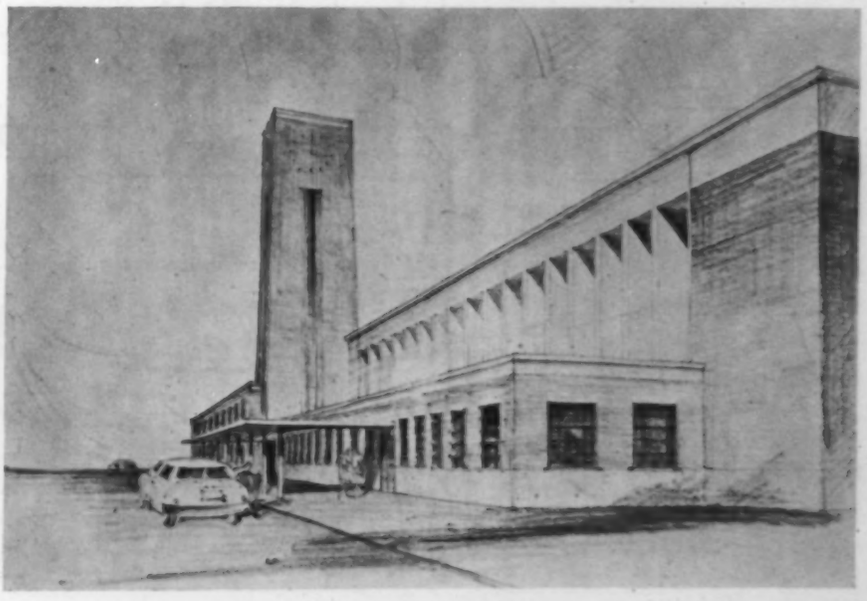
Renderings by Robert E. Kelley

THE new Municipal Ferry Terminal now under construction at St. George, Staten Island, N. Y., will resemble its predecessor in only one respect: it will have ferry slips. When the old terminal was built in 1905, vehicle traffic was about 10 per cent of today's volume, and almost all of it was horse-drawn. Today the yearly passenger volume alone amounts to more than half that of Grand Central Terminal.

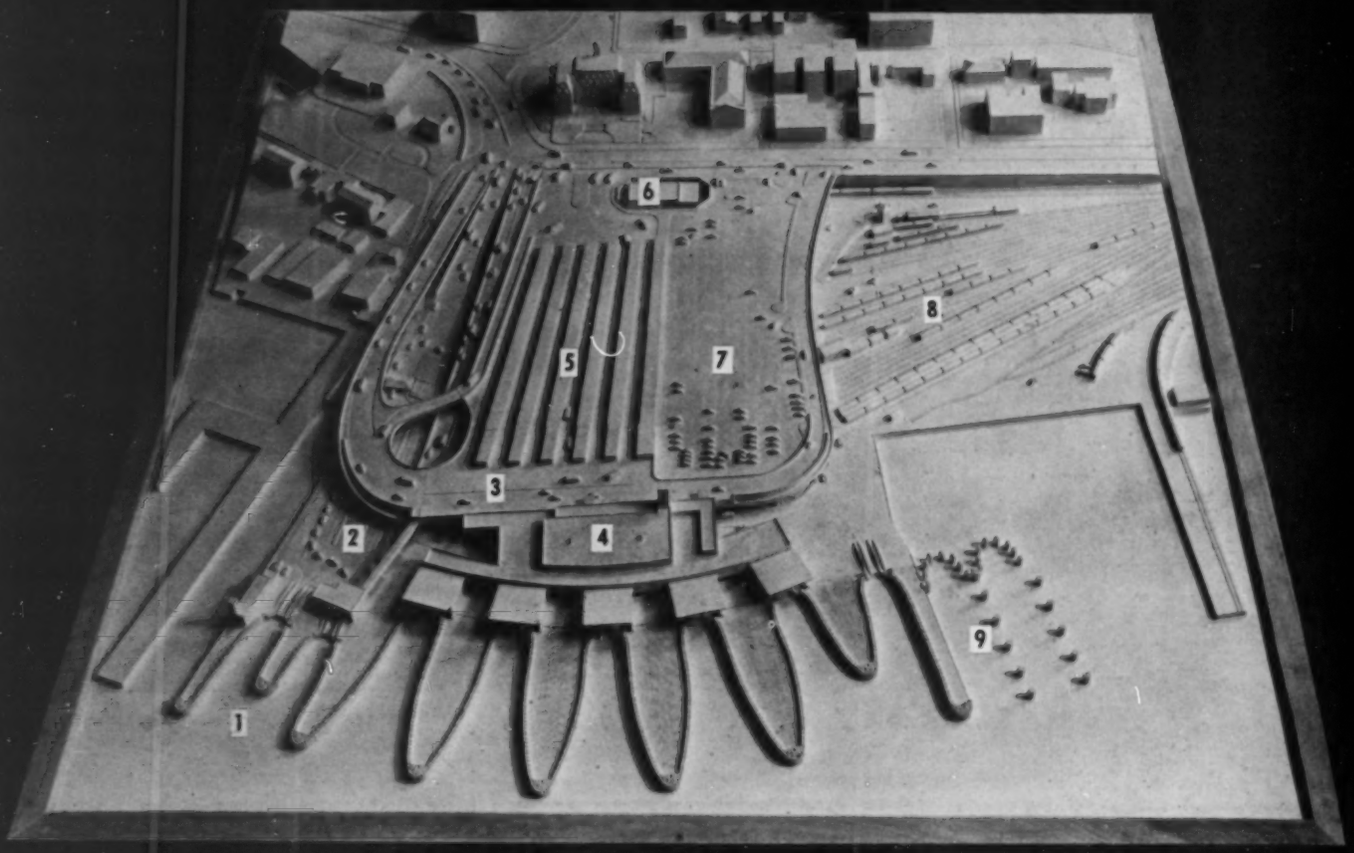
Plans for the new terminal were drawn up only after exhaustive studies of historical background, available facilities and every detail pertaining to ferry operations. On the very day that the plans and model of the proposed structure were presented to the city in June, 1946, the old terminal was destroyed by fire.

Keynote of the plans as finally adopted is the elimination of delay and confusion caused by the crossing of incoming and outgoing vehicular and passenger traffic in a single structure coordinating railroad, bus and ferry transportation. Separate roadways for outbound traffic at the north ends of the terminal area have been provided. The north ramp will also give direct access to the Baltimore and Ohio Railroad yards and to the municipal ferry repair shops, completely separated from the ferry traffic. Five operational slips will be provided for the municipal ferries and two for the privately operated ferry to Brooklyn. Buses, taxis

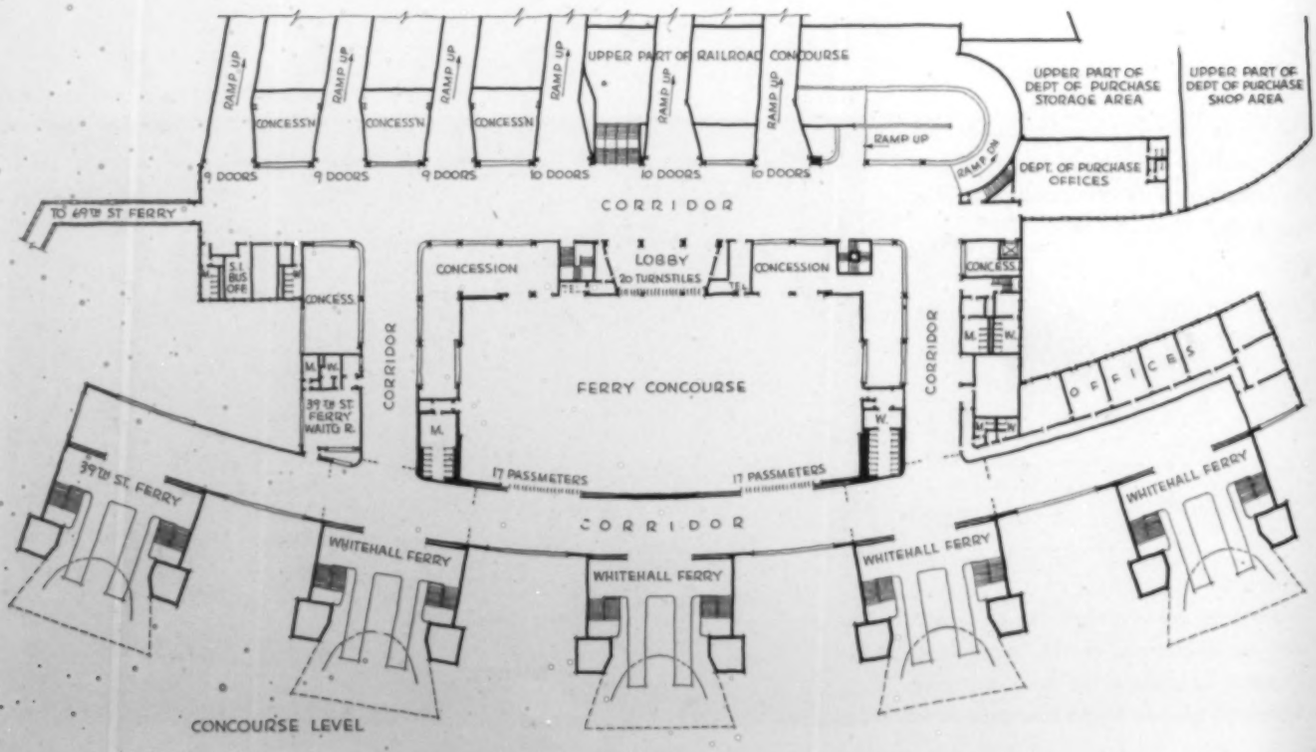
The deep vertical fenestration of the main waiting room is designed to give the facade a columned appearance. The four-dialed clock tower is 90 ft. high

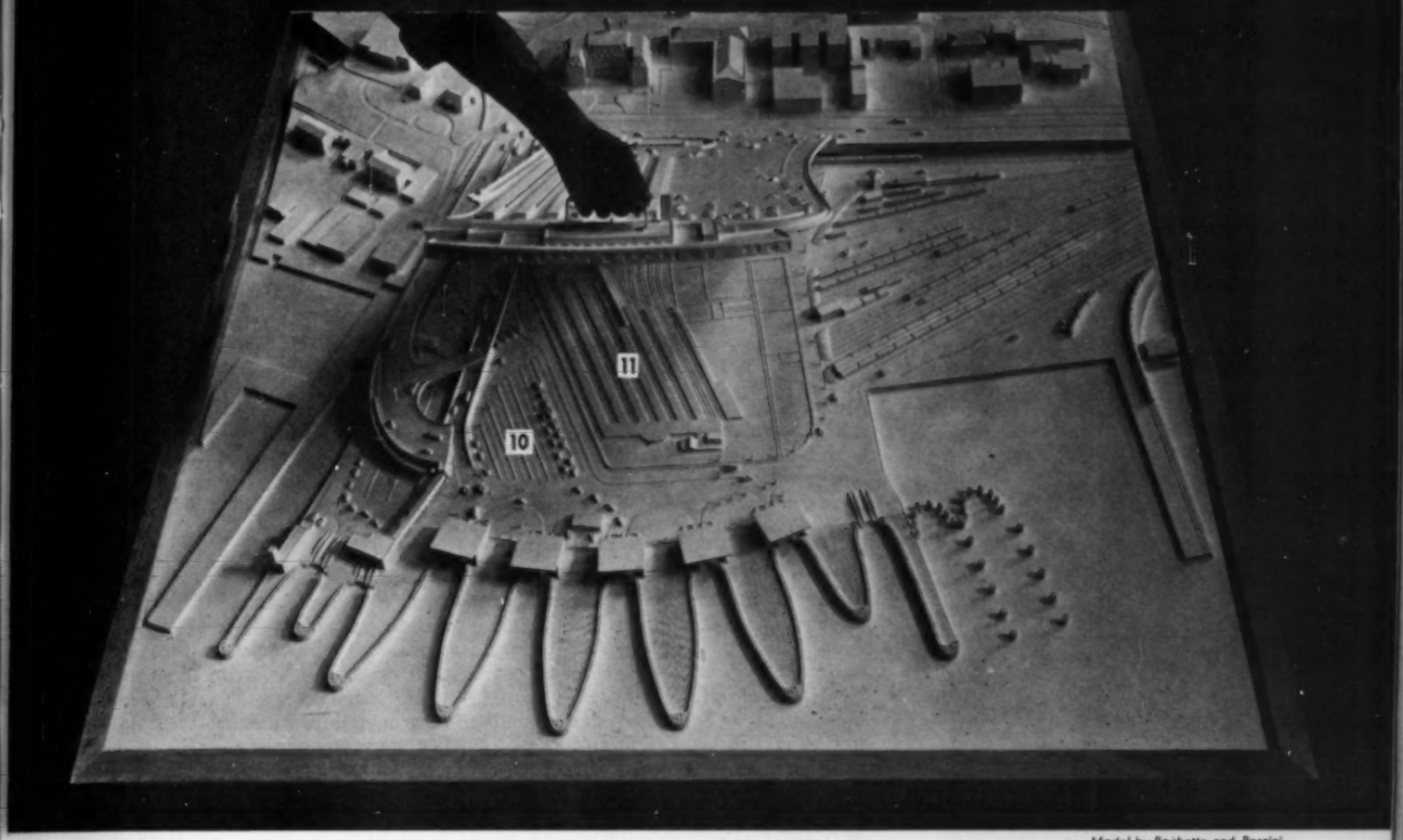


Passengers arriving by taxi or private car are discharged on the upper level, proceed via stairs to the main concourse. Bus passengers will have their own ramps



Key to photos of model, above and opposite page: (1) slips and (2) vehicle lanes for Brooklyn ferries; (3) taxi, private car and bus viaduct; (4) roof of terminal; (5) bus loading and unloading platforms; (6) transformer station; (7) parking space for 500–600 cars; (8) railroad yards; (9) lay-up and repair slips; (10) vehicle lanes for Manhattan-bound ferries; (11) railroad terminal

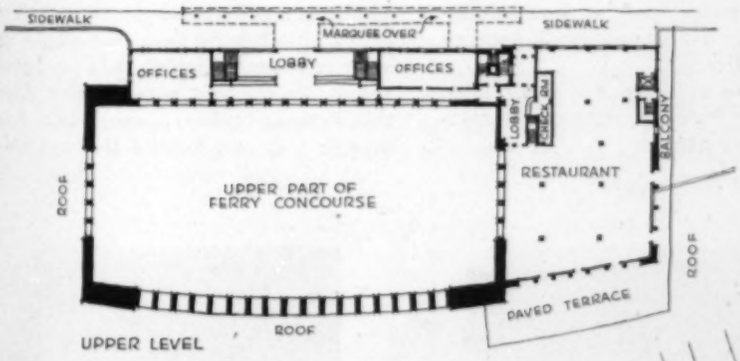




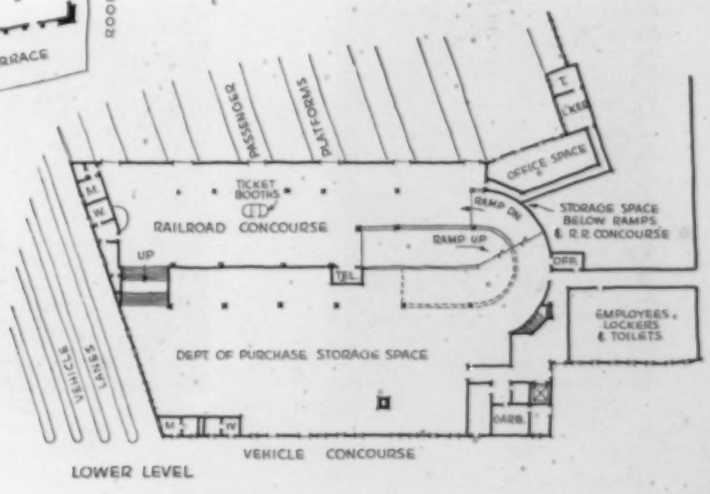
Model by Rochette and Parzini

and private cars carrying passenger traffic will enter the terminal on separate roads and at different levels from ferry-bound vehicular traffic.

The project is being developed for the New York City Department of Marine and Aviation and the Borough of Richmond under the direction of Mayor William O'Dwyer, Borough President Cornelius A. Hall, and Frederick G. Reinicke, Commissioner, and Lewis H. Rabbage, Chief Engineer, of the Department of Marine and Aviation.



Upper level (left) provides a large restaurant and observation decks, offices, and lobby for taxi and private car passengers. Ramps connect railroad concourse on lower level (below) with waiting room

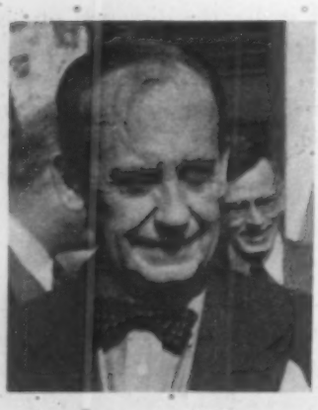


Manhattan passengers will reach ferries from main waiting room, will discharge from incoming ferries into wide exit corridors to prevent cross-traffic. Brooklyn passengers have separate waiting room

ON PLANNING MAN'S

George Howe (silhouette) and Frank Lloyd Wright

Alvar Alto
M.I.T.



Walter Gropius
Harvard

A purposely small group of some sixty articulate thinkers and doers in architecture and allied fields of design gathered at the Princeton Inn March 5th and 6th for spirited discussions of Man's Environment, and what could and should be done about it. Following an agenda thoughtfully prepared by Arthur C. Holden and his committee (Henry A. Jandl, Kenneth S. Kassler, Jean Labatut, Sherley W. Morgan, Robert B. O'Connor), seven sessions were held covering the physical possibilities and limitations of design and the visual, social, philosophical, psychological aspects of environment — from city and regional planning to the design of buildings and small objects.

Differences of opinion enlivened the discussions and stimulated thinking. That there were digressions may have been due to lack of preparation on the parts of some of the participants or just to the fact that particular (though non sequitur) subjects were uppermost in their minds. A few brief excerpts from the opening statements of several speakers are given here with a dozen random candid shots. More detailed reports will be forthcoming later.

The conference ended with Frank Lloyd Wright's dinner address stressing decentralization and a back-to-the-farm movement for veterans instead of university training.

Since the objective was exploration rather than framing conclusions, no resolutions were passed.

TO SHOCK is no longer necessary, not even desirable. Perpetually to make something new may call fleeting attention to one's self, may capture the ephemeral applause of a self-admiring claque; but it is not a panacea for progress. . . . So today the architect . . . must first of all be an interviewer, an objective recorder of needs, an understanding examiner of techniques. This process may well take longer than the final synthesis, the space arrangement, which is the design. . . . There is risk that modern architecture does not follow its own precepts. It is no more noble to preconceive a building with a cantilever, a spiral, or an exo-skeleton and then force everything to fit, than it is to preconceive it in the mold of St. Trophime. . . . Do we really survey the technical need without prejudice; do we refrain from imposing our own clichés; do we avoid facile rationalization and the pseudo-scientific; are we prepared to bring humanism to the mechanism we have already prescribed with such authority? . . . only the thoughtless could answer with a chorused "yes."

— John E. Burchard

It is pertinent to inquire why we admit, as readily as we do, that man is better off when he lives and works in an environment which has esthetic values. In the first place, where does this esthetic value come from? For myself, I do not believe that esthetic

Robert B. O'Connor
New York

Jean Labatut
Princeton

Roy Childs Jones
Minnesota

PHYSICAL ENVIRONMENT

AT PRINCETON UNIVERSITY'S BICENTENNIAL CONFERENCE

Ernest J. Kump
San Francisco

value can be created through conscious aim. Esthetic value is the evidence of an innate harmony that has been achieved through the arrangement of space in such a way that human needs and senses are satisfied.

— Arthur C. Holden

Man's needs for shelter have changed but our tendency in designing man's home must be to simplify instead of to complicate our lives within our homes. The simpler our lives the simpler our homes should be and the better we shall live in them. . . . Let us then PLAN to live more simply; to live more slowly. Let us give of what we have to satisfy the needs of others and let us — above all — live in harmony with our neighbors and specially, very specially, with ourselves.

—Carlos Contreras

We would like to cause the city to grow from a chaos to a cosmos by recognizing human dependence upon community organization. We would divide the city into neighborhoods, providing their citizens with self-government, with education and recreation, with some morale building institution like the church; and where possible with industry and commerce. . . . The tendency to have every shopping center in America look like every other; to produce houses by the thousand all the same, like trailers; to have mail-order lampposts and hydrants and street signs; — this is not only banality, but it ends in apathy and stultification. . . .

— William Roger Greeley

The democratic architect will not tolerate compensation on the basis of a percentage of expenditures incurred. It is unethical because it creates a sharp and unnecessary conflict between the interest of the architect and that of his client. For him to make unusual effort to achieve economies and so to reduce costs, or to achieve exceptional quality through fine design, is for him not only to be unpaid for such productive service, but often to be penalized for it in reduction of compensation. . . . American industry and culture should decentralize, leaving in the city only the functions and population actually needed there. The suburb is not the answer.

— Arthur E. Morgan

George F. Keck
Chicago

Architecture *must* transcend engineering because the human activities which it houses are not merely physical and utilitarian in the narrower sense, but also, and significantly, cultural and spiritual. Family life, the processes of government, education and research, religious worship, and even business and industry as responsible and dignified human activities, all involve human relationships, human values and evaluations, cultural traditions and standards, spiritual aspirations. To ignore these is to reduce man to his merely physical

(Continued on next page)

Sigfried Giedion
Zurich

Stowell Photos

William W. Wurster
M.I.T.

Richard J. Neutra
California

M. Roberto, Brazil; Jose Sert, N. Y. (back); Serge Chermayeff

components and acts; to recognize and promote them is the distinctive task of architecture as an art.

— Theodore M. Greene

The end, if we would recapture unity of art and life in building, must be to create significant space, whether real, that is useful and practically dimensioned, or ideal, that is symbolic and proportionally dimensioned, in terms of contemporary thought and feeling, not only socially, economically, and politically, but scientifically, philosophically, and spiritually. This is the great aim which the so-called modern school of design, for all its blind gropings, has set itself. This is functionalism in its broadest interpretation. The building itself becomes a function, in the modern mathematical sense, that is to say, a dependent variable.

— George Howe

The greatest change in the character of building design comes from movement which constantly insists on lighter and more flexible structures. At the same time this change does not want to sacrifice anything in the way of fire and other human safety factors, nor does it want to increase upkeep. Movement must include *social changes* (less permanent family, less children, changing jobs); . . . *transportation changes* (automobile or airplane); . . . *mechanical improvements* (electricity, gas and radio join with transportation to decrease urban advantages); perhaps *spiritual*, which wants to give each generation the pleasure of creating its own shells.

— William W. Wurster

The question whether the planning-designing profession shall cater to a poorly considered requirement list, handed in by the owner, is in need of qualification. . . . If the executing architect is to abide by a programmatic requirement list, it certainly should, for best results, be developed by a set of professionals superior to himself. . . . The major brain investment is in the program, a preliminary which is fertile with potential life only if it digests all supposedly "realistic" requirements in the light and radiation of a foresight, which activates, because it is more imaginative than bound to the pedestrian statistics of the past.

— Richard J. Neutra

It is this extension into the third dimension that is our special concern as architects. Our arrangements of structures in space are limited by the uses to which land can be put. These land uses, in turn, are limited by law and custom. No matter what we plan, unless law and custom — the deep-seated *mores* of the people — are on our side, we cannot build those broad plans we put on paper. . . . We must always remember that this city we wish to create must be lived in, worked in, played in by all the kinds of people there are. If we do so we will not, I am sure, go too far towards Utopia — which was, I believe, a mirror of dictatorship.

— Henry S. Churchill

The successful planning of Man's physical environment means *knowing* Man — not only as factory worker, artisan, merchant, doctor, clergyman, professor — as earner and spender — but Man also as husband, father, brother; as poet, philosopher, painter, dreamer; Man as *spirit* as well as body, *Man as a whole*. And we, as Architects, shall never know *Man* as a *whole* until we discard the narrow, particularizing, separating view of Science, and take the *broad, unifying view of Art*.

— Ernest J. Kump

Planning in a democracy involves effective citizen participation. The planner is only one of many technicians. . . . A comprehensive plan is not the creation of a master mind but a collaborative effort. It is the social ideas of a community or region which are to be expressed in the physical pattern, not the ideas of the technician. . . .

— Frederick J. Adams

During the past three decades we have seen a vast extension of zoning regulations. These have had some value in arresting some of the bad planning practices of the past but they are, at best, feeble devices for building the city of tomorrow. Even the most well-intentioned regulation may produce results that are very far from those intended by the code-writer. I believe that a more hopeful approach can be made by placing a greater emphasis on cooperation and by placing less reliance on restrictive regulations.

— Louis Justement

We must reverse this present way of thinking and acting and must extend the new scientific understanding, namely, that the field and the behavior of the objects are corelative, to our social structure and to the structuring of our physical environment. We must stop thinking in terms of units; we must learn to think in terms of unities, that is, in terms of the organic relationship of units. . . . We can no longer indulge in the mere designing of individual objects, we must follow through all the relationships, that is, we must span the whole field to give contours to the objects.

— Gyorgy Kepes

A public nostalgia exists which, through its "style and form" sentimentality, is in direct conflict with mass production. . . . Advertising has created what might be called a suggestive pictureword language which exerts an enormous impact on the millions of people. This impact not only prevents really clean technological progress, as it is based on artificial obsolescence, but also distorts and destroys basic human and social values. It even affects the sincere designer who is eternally forced to be "novel," to streamline, to be a superficial stylist.

— Walter Baermann

Creative design has been hampered because the designing professions have neglected to appreciate that their value to society must be expressed in terms of exchange and finance in order that the judgments and services of designers may carry weight. Society has not yet evolved a system of long term banking that can be compared to the achievements in short term finance that have been developed by the commercial banks.

— Arthur C. Holden

Legislative regulation of buildings as contained in building codes, zoning and other ordinances . . . is one of the severest limitations under which design must operate. The severity lies in their rigidity and not in their legitimate purposes. The hope for relief lies in the possibility of phrasing these standards in terms of performance or function. It lies further in the selection of administrators who are capable of interpretation of performance standards.

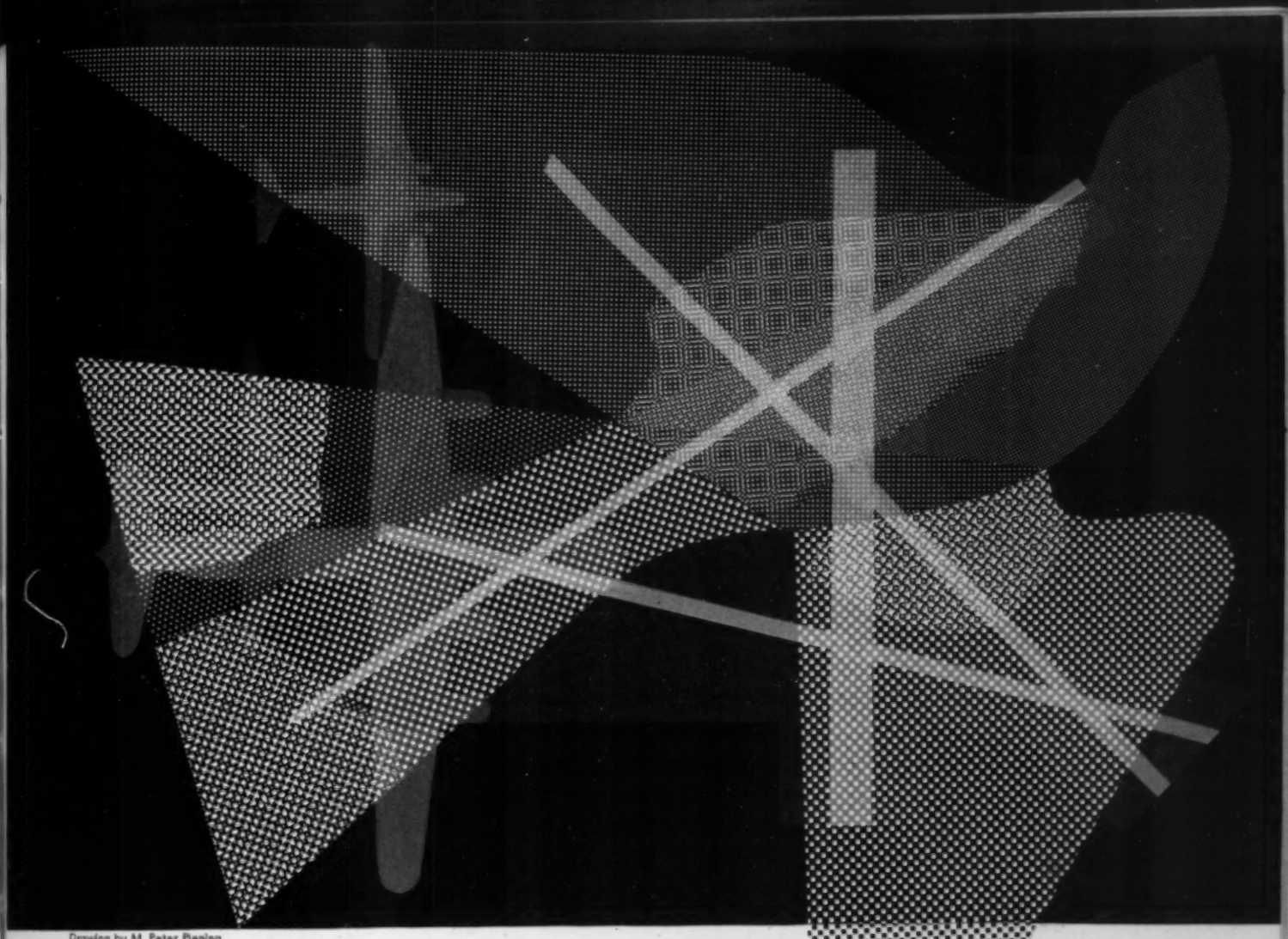
— Howard P. Vermilya

Labor is still largely divided on the individual craft union basis rigidly compartmentised. Many restraints have been placed on product and assembly development. As trend increases toward offsite fabrication there is evident a great need for a new classification — the skilled assembly mechanic, not restricted to any one material. This may require a vertical union with the economic incentive of an annual wage.

— A. Gordon Lorimer

[In rebuilding a city] construction must be piecemeal, because the city must maintain "business as usual." To obtain necessary funds and secure needed legislative authority, the public — the great majority of all the people — must be convinced of the importance, urgency, and desirability of planned rebuilding. The history of planning during the Twentieth Century bears out that plans have not been realized, for lack of organized public understanding and support. . . . The crux of the problem is that centrally located but blighted land commands a much higher price than its economic re-use value.

— Theodore T. McCrosky



Drawing by M. Peter Piening

AIRPORT BASIC RESEARCH

ARCHITECTURAL RECORD'S

BUILDING TYPES STUDY NUMBER 124

THE authors of this study have made a basic contribution which RECORD editors seriously recommend to their readers. Nothing like this approach is to be found either in CAA literature, or in aviation, or architectural literature thus far.

Airports cannot be solved today on the drafting board because no amount of design skill can produce physical order out of mental confusion in the airport client. The architect's next move, therefore, is not to sit back helplessly but to help public authorities formulate the kind of program that an architect can hope to make workable.

This can be done. Our authors show by precept how to make an airport survey, and by example how to study airport service plant. The editors commend them heartily to you.

AIRPORT PROGRAMMING ANALYZED

By J. B. Bayard, Jr.*

Director of Airport Planning for Horner and Shifrin, and Smith, Hinchman & Grylls, Inc.

Most major airports have been developed without the aid of essential elemental studies. The architectural and engineering design of these all-important terminals has had to proceed piecemeal, lacking analysis. It has been compelled to rely on hobbies and on the repetition of individual ideas, most of which have proved to be obsolete even before the mortar was dry on the first executed example.

The present study of air terminals is written for the public interest. This interest has been sadly neglected through ignorance of the fundamental concept of the airport as a public facility. Only small ports are now being built entirely by commercial interests under their own financing. These smaller ports bear no public responsibility beyond that of fitting into the national and local flight pattern so as not to interfere with air traffic. But all larger ports, and all ports for scheduled flying, have been built and financed by public authorities.

Commercial airlines, having proved unable to create their own ports with their own means, must therefore yield to the public interest, which demands far lower capital costs and far more convenient service.

To Go Forward We Have To Go Back

The need for fundamental information is not confined to projects for new airports. This fundamental information must be acquired also for existing airports faced with the necessity for improvement or expansion.

Appreciation of this need by airport planners, engineers and architects is essential, to prevent endless wallowing in a quagmire. The chief reason is that every step is worked out not according to set objectives but according to a succession of negotiations.

Acceptance by public authorities of the necessity for fundamental information is the first prerequisite for any intelligent airport development. Without such awareness, the necessary studies are never authorized or paid for. They are far too costly as a speculation.

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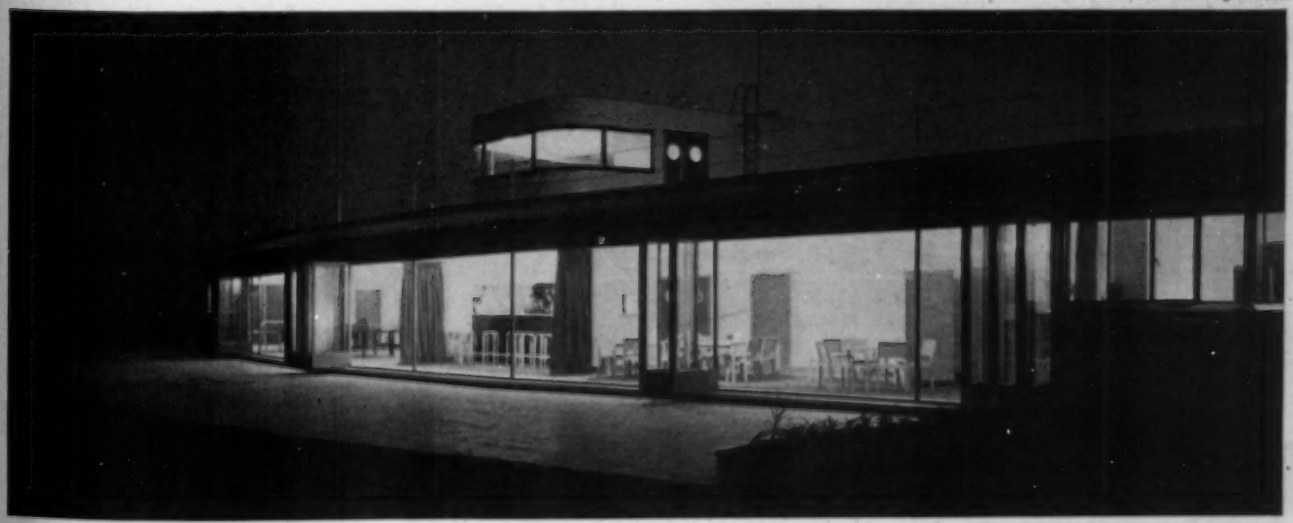
* *Mr. Bayard speaks feelingly out of a lifetime of experience with airports. He received engineering training at the University of Illinois, designed terminal facilities for Transcontinental Air Transport (which operated the first transcontinental passenger service), did market research in aviation for the St. Louis Chamber of Commerce, did traffic and cost analyses for Ludington Air Lines as Superintendent of Traffic, engaged in special operations and analysis work for Eastern Air Lines. From 1934 to 1945 he was with the Bureau of Air Commerce and the Civil Aeronautics Administration engaged in airport planning and engineering. Since 1945 he has occupied his present position. The Detroit airport plan of Horner & Shifrin (engineers) and Smith, Hinchman & Grylls (architects and engineers) won a Haire Airport Award in 1946.*

A ship-shape English terminal of the mid-thirties, at Ramsgate, by David Pleydell Bouverie. Even such distinguished designs as this would be unprotected in the U. S. against butchery and remodeling to make up for lack of foresight in setting up airport programs. The architect's only protection for his design is to extend his service and help make basic surveys, so that the program is correct

Dell and Wainwright Photos



A workable framework or form for such a fundamental analysis is the next necessity. As we shall see, large sums of money have been wasted on "surveys" which have revealed nothing of value to the airport developer.

Bad Effects of Insufficient Information

The traveler, because of the lack of coordinated airport planning and building, finds himself consuming long periods of time to reach airports situated far from where he is, approaching them through alleys and over congested highways. At the port he finds himself unable to buy decent food or find a clean place to eat it; he is unable to purchase gifts, toilet necessities, reading matter, or those other small items which the traveler expects to obtain at a *transportation terminal*. He is unable to spend time between planes in anything but complete boredom. He is made uneasy about his reservation, his ticket, his baggage; and he is irritated by the length of time it takes after deplaning to get himself and his belongings assembled and started to his final destination.

The taxpayer is constantly getting unpleasant reminders of airports through annual deficit budgetary provisions for maintenance, revision, repairs, and total rebuilding of badly conceived facilities. Bond issues are floated for capital improvements on which the taxpayer foots the bill for interest and amortization.

From an *operating* standpoint, we find major errors. For example, after construction had begun on a certain super-airport, it was found that additional runways were needed to keep from blocking the approach paths of neighboring ports!

Every one of these bad effects is reflected in higher charges to the aeronautical users of the field. These charges are then passed on to the public in the form of high rates for services, and high taxes.

MAKING A PRELIMINARY SURVEY

The first purpose of this article is to outline what the owner and designer of an airport, or of an airport system, have to know *before* sites are acquired and *before* the actual designing is initiated.

Basic Research for a Locality

What is meant by research? From the architect's and engineer's standpoint it means acquiring enough information to know whether he has a program or whether he has none.

Is the problem posed by officials the problem?

Is there an existing program? If so, how far does it go? Is it workable?

Have the aeronautical needs of the locality been firmly established?

Has there been a determination of the number and type of airports needed and of their time scheduling?

Have sites been selected?

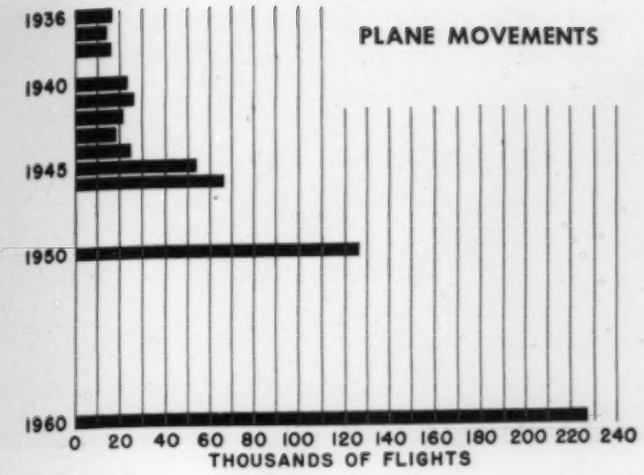
Public Officials are Responsible

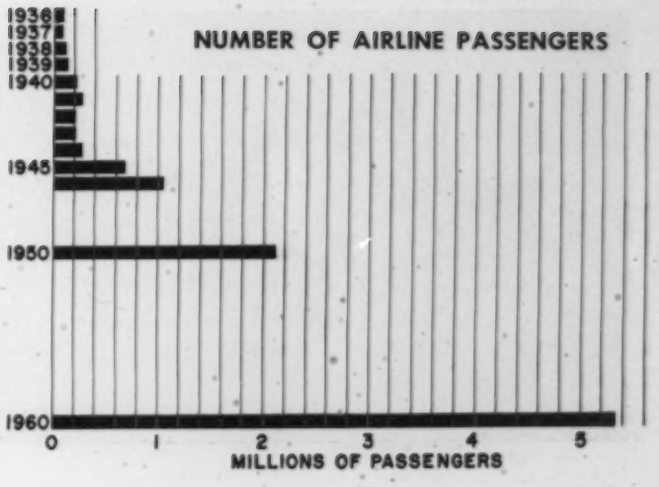
Without fear of contradiction it can be said that more than 99 per cent of all public airports either existing or projected have been conceived and brought to their present state of development without a clear picture of their ultimate use and their economic function in the community. This condition is the result of lack of appreciation on the part of public officials of the impact of airports on community life; it is also the result of collective apathy on the part of architects and engineers in performing the planning function where it is most needed: in the first preliminary phase.

Wide World Photo

Confused methods of operation (left) and confused city planning (below) bring the passenger down to earth with an emotional thud, no matter how conscientiously the architect has labored. To get right answers he must help clients state right problem

Metro News Photo





What is an Adequate Survey?

In some instances the immediate problem is to set up an airport system, an airport administration and a method of financing. In some instances a single airport previously built has to be expanded and adapted for joint scheduled and non-scheduled operations.

In some others there is an urgent need to separate private flying from commercial flying or national from international, at the same airport, and to provide individual building areas for each. Regardless of the scope of the immediate problem, the essential items of information are always practically the same. The difference is merely in the degree of thoroughness that must be given to any particular part of the investigation.

How Do You Set Up a Survey?
How Do You NOT Set Up a Survey?

It is our firm belief that the public authority should make up the best possible description of its problem according to its own thinking and then ask different consultants for a detailed outline of their proposed *method of approach — their procedure in getting to a solution*. Too many surveys have been made on too vague a basis. Professional firms have been asked to enter competitive bids to "survey the airport needs of McCushlin County." The resultant bids have been based on approaches as different from one another as camels and fish. In a recent well-known episode the highest proposal was for $200,000 and the lowest, which was accepted, was for $47,000. Very obviously the two proposals did not cover the same kind of job. It is safe to assume, when a survey is made on a dollar basis, that by paying $5000 you get work to the value of $5000; again, if you pay $10,000 you get $10,000 worth of work — but you cannot know until it is too late whether you got the *right* $10,000 job done or not.

Differences in Penetration. One important item of judgment in making a survey relates to differences in *penetration*. Money can be wasted in too detailed an exploration of items which should only be skimmed until something else has been ascertained first. Other kinds of facts may have to be known in full detail.

Differences in Importance. It is astonishing how much analysis has been given to factors which are easily amenable to scientific determination, compared to those items which may be far more important but which involve more ingenuity in research. For example, soil conditions, now at the top of the list in a great many published treatises, should come in behind a great many other items. Thus, in judging between two sites, the primary question is *not* which one can be prepared more cheaply for runways. Suppose that the cost of preparation at one of two possible sites is $300,000 and at the other site $100,000. The economic situation including market factors may be such that you could spend the $300,000 and be sure of getting it back, or you could "save your money" by spending only the $100,000 — and never get it back.

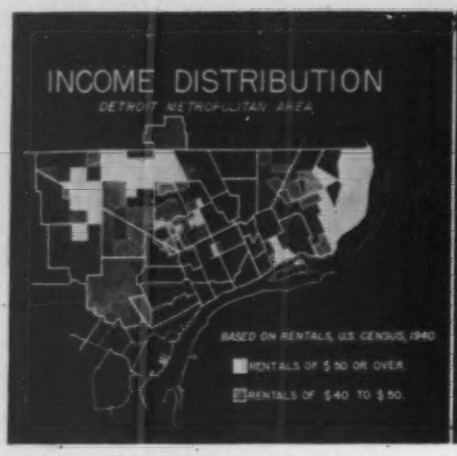
Another fault of surveys on a dollar basis is that the public authority may receive a mere compilation of self-evident factors already published elsewhere, and the authority has no recourse.

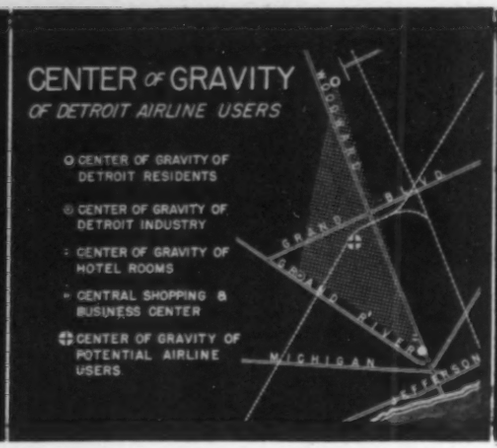
For all these reasons it is much sounder to allow the survey to be made by that firm or group of consultants which gives evidence of the soundest *method* of investigation.

CONTENTS OF A SURVEY

The same basic information will be contained in a good survey regardless of whether it covers an area or a single port, or whether the port is large or small.

How do you determine an area? An airport area corresponds to an existing area of retail consumer influence served by adequate transportation and community facilities. A word of caution is needed here: most transportation networks completely ignore political subdivisions. Thus the obvious location for the major terminal of a certain midwestern city is across a big river and in another state; for cities on a national boundary the most economical site may even be across the border in another country. In outline, the survey will cover:





I. GENERAL FACTORS

A. *Growth Indices*

1. *Population characteristics of the selected area:* Rates of growth. Income (basic information on what income groups use airplanes is very difficult to secure from airlines). Telephones of all types. Postal receipts. Power consumed.
2. *Industry and commerce:* Retail trade — sales, payroll, number of employees. Wholesale trade — sales, payroll, number of employees. Manufacturing — millions added by industrial products, number of employees.

B. *Land Use Pattern.* Charts showing areas devoted to residential, commercial, or industrial use, also densities of occupation of the land.

C. *Ground Transportation.* For the future of aviation, even the development of new efficient aircraft is no more important than the assumption of *responsibility for transportation of passengers on the ground.* The tendency is to analyze the ground trip toward its point of origin. The airlines share the responsibility for developing a coordinated system from the moment the passenger leaves his own front door. An ever increasing proportion of air traffic starts as commuter traffic. The vast majority of airline passengers may be expected to come to the airport by common carrier — although this expectation depends very heavily on what the airlines are going to do. A coordinated ground transportation system would eliminate a vast amount of reduplication of service and expense.

II. AERONAUTICAL FACTORS

This concerns the regional share of total air traffic business. Contents are:

A. Comparison of the *regional picture* with the U. S. transportation picture and determination of the region's share.

B. Evaluation of *local factors* influencing this ratio in the future.

C. A similar evaluation for *non-scheduled* flying, with allowance for local deviations from the normal pattern.

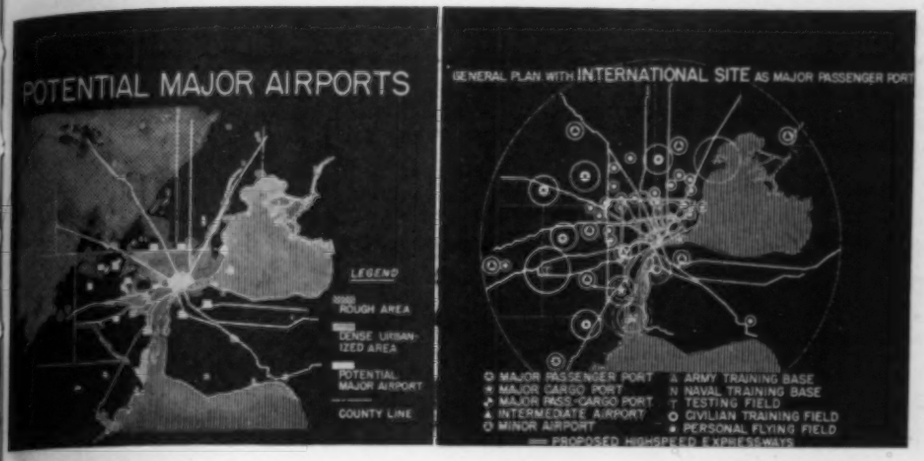
D. *Local patterns and conditions.* This includes: (1) meteorological data — the "wind rose" and what affects it; (2) topographical survey; (3) soil survey (a topographical survey is concerned with contours only, while a soil survey is concerned only with the composition of the soil); (4) airway patterns in the locality; (5) existing airport facilities.

E. Establishment of a *trial pattern* for a local airport system to meet the aeronautical requirements as these are determined by an evaluation of the factors listed above. (At this point in the survey it is necessary to strike a trial balance.)

F. Computation and compilation of *capital costs* involved in the trial system. This includes setting up costs for alternate or competitive locations as well as the first-line locations tentatively chosen. In brief, a rough sketch is made showing both the first-line and second-choice facilities and their comparative capital structures. An important step is to determine the air navigation facilities required in each specific location. These air navigation facilities involve the runway pattern (including taxiing distances for planes), markings, radio beams, obstructions, etc. They will vary widely.

III. ECONOMIC FACTORS

The economic analysis of an airport system is supremely important. In a period of prosperity it is quite possible to set up almost any kind of workable airport system. It is possible to get it financed and started in operation without too much trouble. But look to the future! In a period of depression, parasitic functions are the first to lose public support, and your beautiful uneconomical airport system will collapse a lot quicker than it was inflated.



Five charts from among perhaps fifty, made to help the authorities and citizens of one city visualize the factors bearing on their individual airport problem. These charts were also made up into film strips, so that they could be projected to very large size for big audiences.

Charts should, of course, never be used merely to "dress up" a story. A chart sequence is a statistical motion picture carefully plotted so as to clarify, and not confuse, the basic situation dealt with.

A. *Income potential* must be balanced against capital costs. (The capital costs are those described in II above.) Income potential consists of:

1. *Revenue from aeronautical activities.* These consist of scheduled operations and non-scheduled operations. The list which follows applies to scheduled operations. All or a part of the same list applies to non-scheduled operations: landing fees, ramp charges (including telephone outlets and gas outlets), terminal building rentals, office space rentals, utility charges (electricity, water, sewerage, etc.). Personnel services such as janitor. Ground rentals including charges for communications buildings, hangars and shops, tank farms. Commissions for items such as bus and taxi privileges.
2. *Revenue from obvious non-aeronautical sources.* These include: (a) private automobile parking; (b) food service — the airport restaurant, coffee shop, in-flight meal preparation; (c) conveniences — telephone booths, Western Union service, lockers, toilets, newsstands, valet service involving barber shops, beauty parlors, shoe shine stands, clothes pressing and cleaning and the like; (d) advertising. An existing airport which shall not be named betrays the glaring defect of a 1700-ft. concourse serving a vast public and devoid of all provisions for advertising revenue. Advertising, which crept into railroad stations higgledy-piggledy, should be consciously planned in airports. In a certain western port, situated in rich ranch country, a major revenue-producing feature is a display of farm machinery.
3. *Revenue from merchandising at the airport.* Wherever a high-income public congregates in large numbers as it does at an airport, there is an implicit opportunity for clever merchandising. Airport promotion which ignores this fact deserves the fate it will receive. On the other hand, blue-sky promotion is out of order.

Even a preliminary survey has value only to the degree that responsible potential users have been interviewed to ascertain the conditions under which they could use the airport as an outlet, the kind of facilities that they would need, and again the capital cost of such facilities balanced against income from possible rental charges. Since the airport is the gateway to the city for its best customers, high-class department stores and high-style shops may well use the port as an outpost, benefiting not only from the direct sales but from the publicity.

4. *Revenue from entertainment and recreation.* (a) An airport theater in many situations is a natural — and the possibility must be canvassed that it might be used alternately as an auditorium for fashion displays or other gatherings. (b) Sports facilities. Here the possibilities are so diverse that they may be only suggested. Often the natural situation for a port is in open country rather than in built-up areas; and adjacent grounds might be developed for various sports such as tennis, handball, possibly even baseball, very profitably. It should be noted that even a free public park in the vicinity of an airport will increase the turnstile revenue derived from added airport spectators, plus important income to concessionaires.

IV. ADMINISTRATIVE

The primary survey is far from finished even after it has clarified the aeronautical situation and the economic potential. Public officials, who are notoriously inexperienced in operating what amounts to a complex business enterprise, are in need of suggestions from an impartial source such as the architect-engineer consultants making the survey on the possible financing for the airport or the airport system, and on the administrative structure.

The questions which occur at this point stand at the borderline between public policy and shrewd business management: *Who is benefited by the airport? How widely*

are the benefits distributed? (Can it be fairly said that the population as a whole is the beneficiary of an operation which serves directly only a small fraction of the people?) Can those whose direct benefit is unquestioned participate in assuming the capital cost and the possible operating cost? Does the structure proposed provide for the most efficient business and economic setup?

An outstanding example of a corporation performing a public service in a complicated transportation field is the Port of New York Authority. It took 14 years to achieve the creation of the Port Authority as an enterprise disentangled from the fortunes of political administrations. There are not 14 years available for setting our airport facilities on their feet.

The success of airport facilities is inseparable from their physical design. The most careful method of financing can fail if the runway pattern, for example, causes the terminal buildings to be jammed against a highway.

It is for this reason that a report issued by a team of architects, engineers, and planners can well recommend an administrative setup. This has already been done in at least one conspicuous example.

V. STAGES OF DEVELOPMENT

Any competent airport survey sets up a master plan — not all of which can be built at once. The time factor is as important as the space pattern. An orderly sequence of development, provided for in advance, has advantages too obvious to require discussion.

VI. A FINANCING PROGRAM

Only after all of the foregoing factors have been isolated and examined so that basic decisions can be made is it possible to set up a rational financing program based on capital cost, amortization, maintenance and operating expenses, and firmly established schedules of revenue.

Restaurant facilities are the most important single source of non-flying revenue in many ports. The smaller view shows present-day tentative use overlooking the field. The drawing on opposite page shows full development in "grandstand" style as conceived by Harrison & Abramovitz, Architects, in their New York Idlewild project

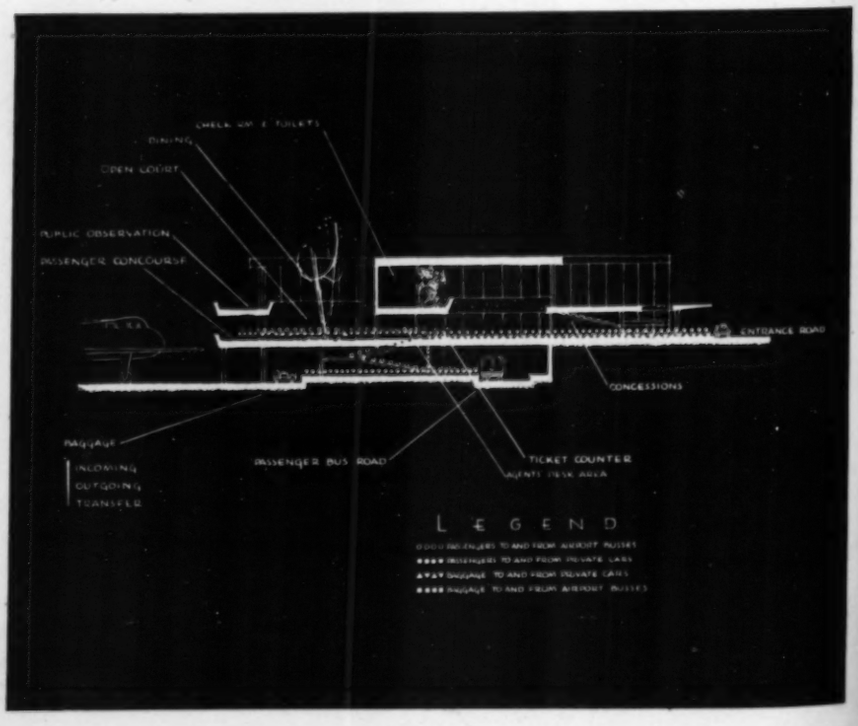
BETTER TERMINAL

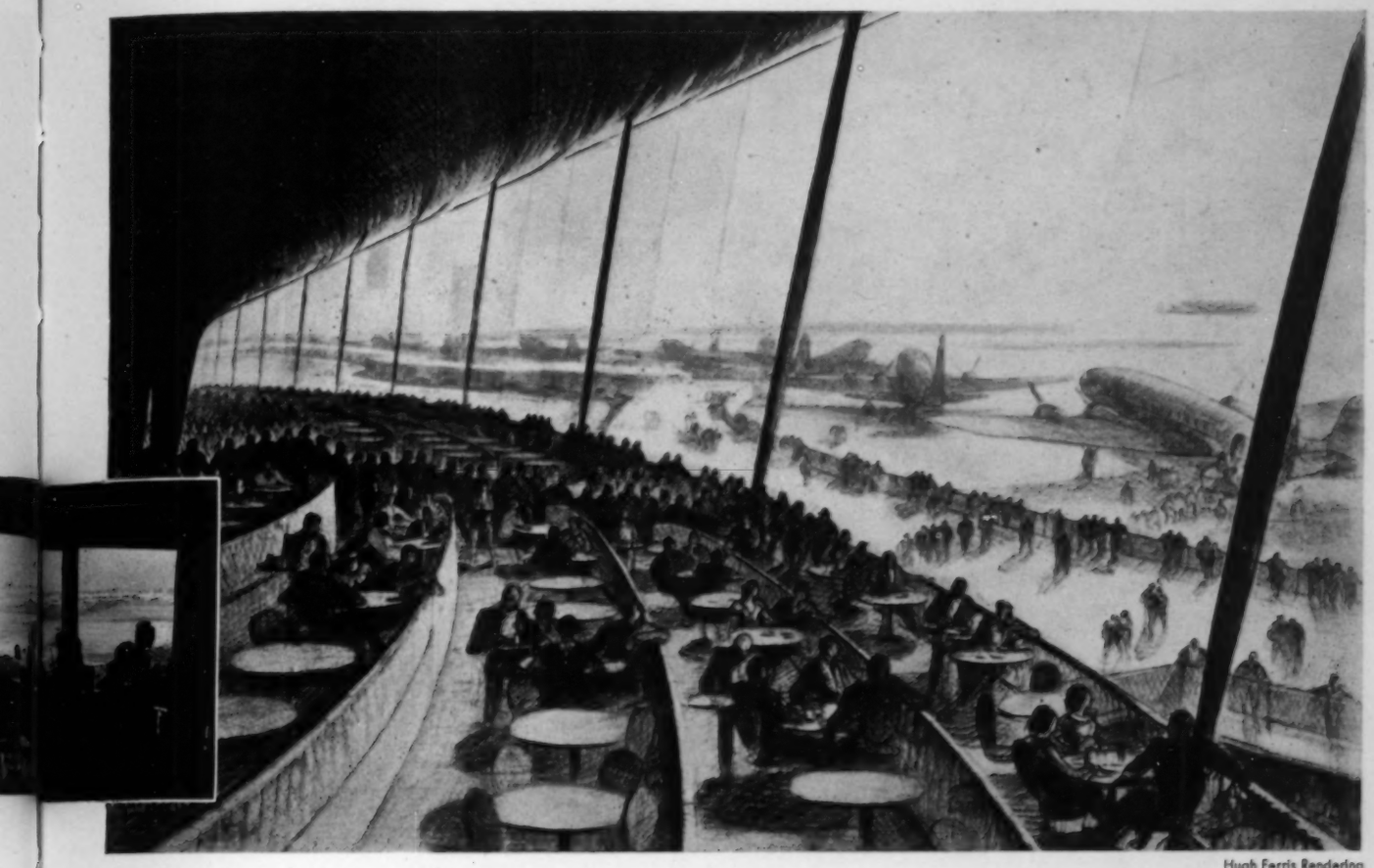
The accompanying scheme has been carefully evolved by Smith, Hinchman & Grylls designers to illustrate an integrated approach based on findings of many surveys.

The scheme will be more fully illustrated and explained in a coming issue of the RECORD.

Salient features are the consolidated handling of passenger traffic and baggage up to the moment of emplaning; full and convenient development of conveniences and concessions; segregation of control tower and offices from the main terminal building.

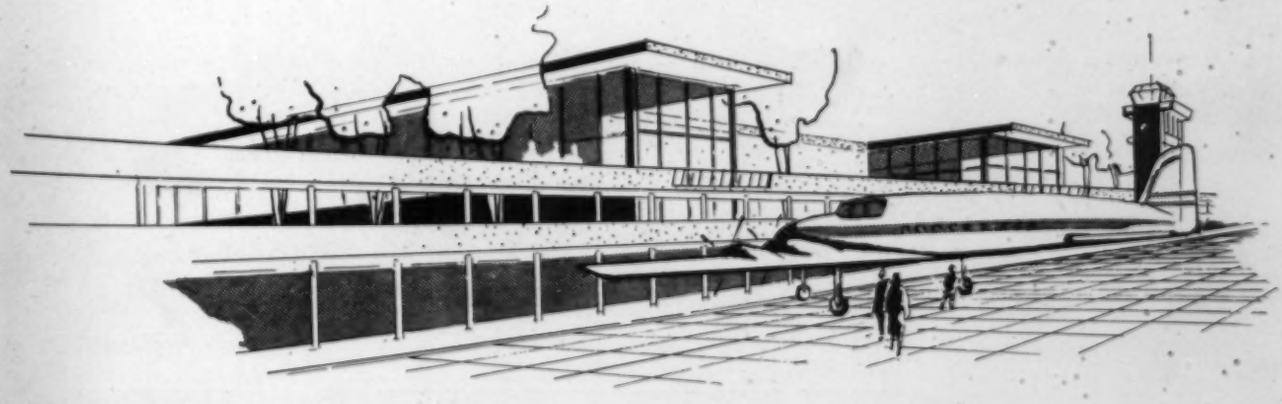
The perspective, taken from the field side, shows the generous projecting lounge (left) and main dining room (right) forming an extraordinarily open and roomy court space in between. Shops (elevation) are equally convenient from highway and interior

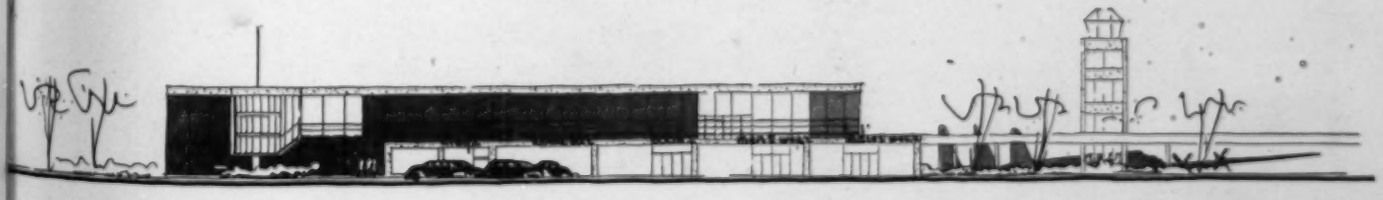


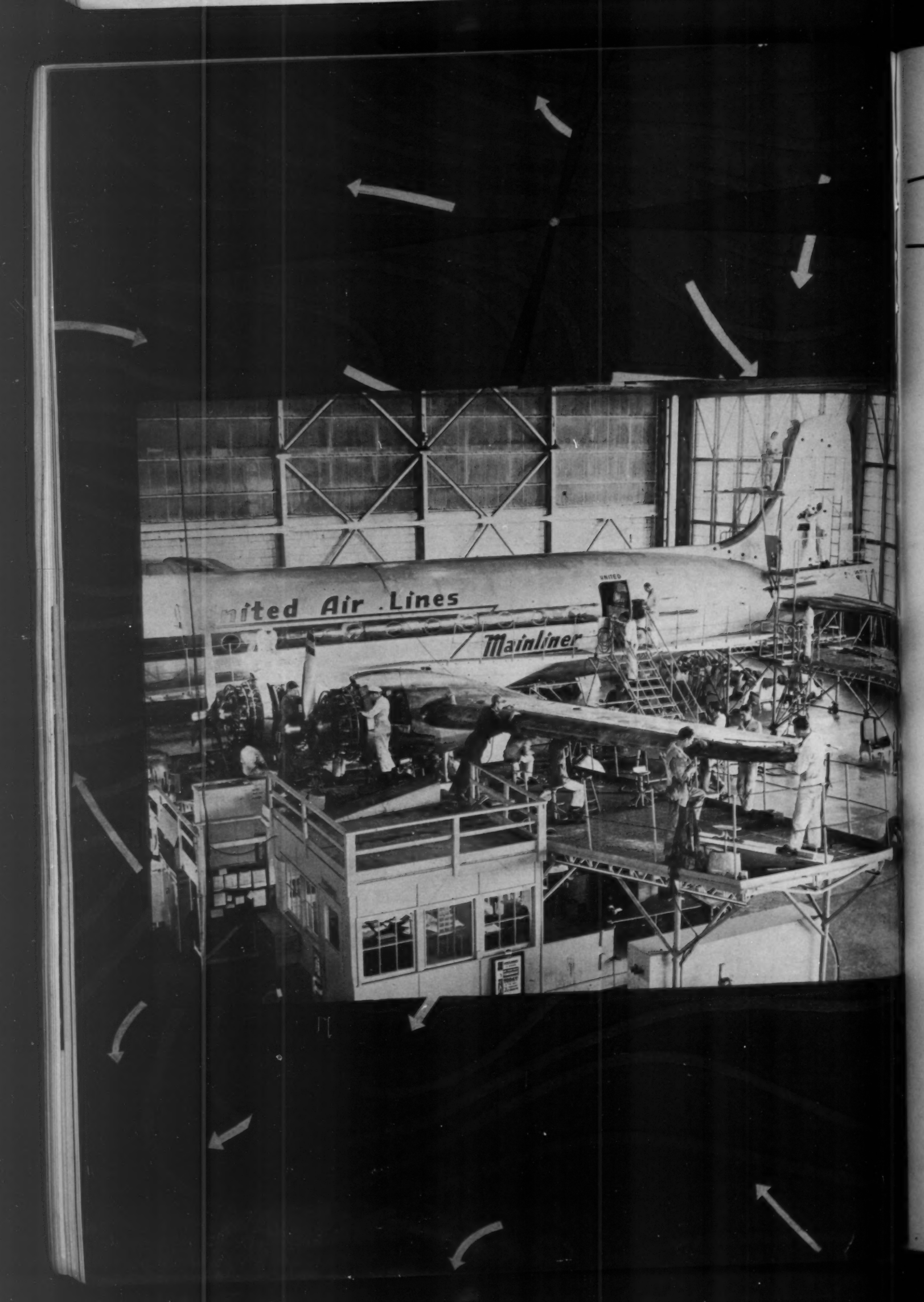


Hugh Ferris Rendering

BUILDINGS WILL FOLLOW ON GOOD SURVEYS






nited Air Lines
Mainliner

PLANE MAINTENANCE PLANT ANALYZED

Discussed by

Carl M. Kneisel
Division Airways Superintendent, Pan-American Airways, Inc.

Max Abramovitz
Architect

Fred N. Severud
Consulting Engineer

CHAIRMAN: Starting at the most familiar end, my first question is, do we need hangars?

MR. KNEISEL: Yes, we need hangars. There are two types that an airline may need. One is a hangar that is required for routine service: that is, some small service along the route. The other type that you require is for main-base service, which is entirely different. It is much more elaborate.

Naturally an airline can't afford to have main bases scattered all along the route.

Why do we need hangars? There are certain services to be performed, such as those on the landing gear, which require jacking up the plane.

You can readily see what an area you have in the tail and wings. On jacks, it is quite critical — any wind acting on the rudder might throw the plane off the jacks. It has happened several times.

Another thing: in servicing, your labor costs go up terrifically outside — especially in climates such as this. Unless you have a good place for the men to work, your efficiency goes way down. In a close study you may find that your hangar costs are one of the cheapest items in the total operating costs.

CHAIRMAN: Mr. Abramovitz, did you have some different experiences?

Climate and Working Conditions

MR. ABRAMOVITZ: Through force of circumstances, in China we worked without hangars. We used nose hangars carefully designed and operated. The climate was in our favor and the boys had a special incentive to get out the work. Still, the boys became so accustomed to working that way that when lines of communication opened and we had access to hangars they didn't want hangars any more. It made me ask, isn't there some element of psychology to be developed in our peacetime operations?

My quarrel is with the form hangars have taken today — they seem such a hell of a big construction and a hell of a big investment with such hunks of space unusable. For what it does, is a hangar costing some $4 million really cheap? If you are simply thinking of a hangar as *some* kind of enclosed space in which you work on your equipment I am agreeable.

MR. KNEISEL: A lot depends on climate. Where labor costs are high, the cost of working outside in poor climate is going to be two or three times as much as where the working conditions are good. We too have had experience with nose hangars. Compared to the extra labor cost in the open, the extra hangar cost for full enclosure is cheap.

MR. ABRAMOVITZ: When it takes only a couple of hours to move a plane, why not a major overhaul shop down South and just the small stuff along the northern routes?

MR. KNEISEL: We have made quite a few studies. Unless the good-climate area is close to your high-density route, you are under a severe penalty not only in airplane hours but in crew problems, schedule difficulties and administrative overhead. You gain only on ground-base personnel and facilities.

Nose Hangars and Big Hangars

MR. SEVERUD: Before we drop this discussion of nose hangars *vs.* big hangars might I suggest something in between? Here's an example (page 120, 2) where all the main equipment for handling is in a permanent minimum space. A pair of movable units — what you might call "box-cars"— close in from both sides over the wings after the plane is in place. It is a simple structure without those terrific trusses and vast areas that cost so much. Moving back the two box cars releases the plane. You don't have to worry how much planes change in shape because adjustment becomes very easy. You have all the equipment needed, and the enclosure. Without assuming that this is a final answer, what do you think of the principle?

MR. KNEISEL: What are you going to do on a plane on a major service job? Take the CV–37: The tail is 57 feet in the air. That's a five-story building. It's a terrific area.

MR. ABRAMOVITZ: It's perplexing, trying to keep down

United Air Lines Photo

Official U. S. Navy Photo

An engine overhaul plant at a main base. Speaking for the airlines' viewpoint, Mr. Kneisel declares that we need to design an "entirely new kind of facility" where shops occupy a separate area from hangars, are bigger, and more important to airline operation

the size of hangars, and keep them flexible, when we don't know about future planes. Isn't it true that the planes you people may have to fly in a couple of years can't get into the prewar hangars?

MR. KNEISEL: That has been the trouble all along. I have yet to see a hangar that I considered big enough. No one has looked far enough ahead.

MR. ABRAMOVITZ: Suppose they do. The war has spoiled us about spending dough. When you get down to cold turkey you can't just spend $10 million instead of $5 million without exhausting every other possible way of working. If you neglect one, you'll live to regret it very much.

MR. KNEISEL: There are two things you can do. You can build a small cheap hangar that you amortize over the life of a certain plane, or you can build big enough for anything in sight. The extra space is not so costly. It quickly fills up with more service docks, equipment, more men, more everything. At La Guardia we haven't a spare inch left.

Arrangement Might Bring Down Size

MR. ABRAMOVITZ: You can always build a hangar *big* enough — that is the easiest thing in the world to do. The brass-tacks question is how *little* you can build? If this meeting could get people to thinking about what is good or bad about existing hangars, and *what goes on inside hangars*, and how to get *efficiency by better arrangement* instead of relying on raw bulk —

MR. SEVERUD: For example, if there is a central equipment line, and the field is such that you can enter from both sides, I believe that there is self-evident economy in making this central area one long line of equipment and stores, and let the hangar expand indefinitely in length (page 121, 5).

MR. KNEISEL: Wait a minute! Let's get the basic service principle clear first.

You will find that the hangar area is actually the smallest area that you require. The shops are the largest area. When a plane came in with a bad instrument, we used to take the instrument off the plane, repair it, and put it back in the plane. Now, we take it out, put a new one in, send the instrument to the shop — and keep the plane flying.

MR. ABRAMOVITZ: Then why don't the manufacturers take care of your major overhaul and repairs?

"Entirely New Service Facility"

MR. KNEISEL: Fleet size affects that. Usually your fleet is not big enough so that you can afford to leave a plane out of service for a couple of months.

The airlines are gradually going to engineer a service facility such as they have never had before. For example, we shall have production control.

We shall have production control. We shall know before the plane arrives what is to be done to that airplane. If it is scheduled to go into the hangar at four in the afternoon, the replacement parts will be right there, the men will be ready, the plane will be brought into the dock, the parts that need repair will come off — even if it is a whole power egg — the new parts go right on. The plane continues on its scheduled flight, and the parts that have to be serviced can go to a shop that can be a mile away if that is necessary —

MR. ABRAMOVITZ: Then it might be better to have hangars small, temporary, and cheap?

MR. KNEISEL: Again, you have to balance that. Say that you have a short route of high density, where you probably are not going to fly anything bigger than the DC-4 for a long while. Then you can settle on a smaller facility. But for long-haul operations airplanes are going to keep growing larger. They haven't reached the limit of size yet.

MR. ABRAMOVITZ: We are really in a situation where I don't know that we can jell on a hangar.

I have come to the conclusion that you ought to call the whole thing a service area and analyze the whole service area, and concentrate no more on the hangar than you do on the engine overhaul section or the sheet metal or the welding or any other section.

What Shops Are Needed

MR. KNEISEL: Speaking for our own operation, we have come to the conclusion that at a main base we need much more besides hangars with small lean-tos — the rest goes into separate shop areas.

Let's take shops. You have your engine shops — then you have a fabric and equipment shop, and an accessory shop and an instrument shop, a radio shop, electric shop and hydraulic shop.

CHAIRMAN: What is this hydraulic shop?

MR. KNEISEL: There is a terrific amount of hydraulic work. Then you have a paint shop, metal welding, carpentry, automotive, stores and offices. Stores should not be centralized because then you are spending man hours to take a mechanic off the job to get a bolt and nut. You need satellite stores next to each shop. So when you add them all up you end with a terrific area much larger than you have in your combined hangar area.

MR. STOWELL: That is a concept that we ought to get across to the architects and engineers. We should have some data as to where shops should be located and how connected and sized, so designers would have something real to work with.

MR. KNEISEL: We have our own studies but every other airline is a separate individual case.

No Good Precedents Exist

CHAIRMAN: Is there any port tolerably well laid out in its service facilities that we could use at least as a point of departure?

MR. KNEISEL: None that I know of. They are not engineered to our operations. We have had to adapt out operations to them.

MR. SEVERUD: Do you think that the study Pelham and I made on a combined hangar and shop area (page 123, 9) might be of interest in this connection?

MR. KNEISEL: We have changed our thinking since then. We want to remain free to expand our shop space in *all* directions.

MR. SEVERUD: You still believe, don't you, that along the route the equipment may be more fully concentrated in the hangar?

MR. KNEISEL: It depends on what you are going to do. You have a major service and short service to take care of. Hangars and shops have to be equipped to do this work.

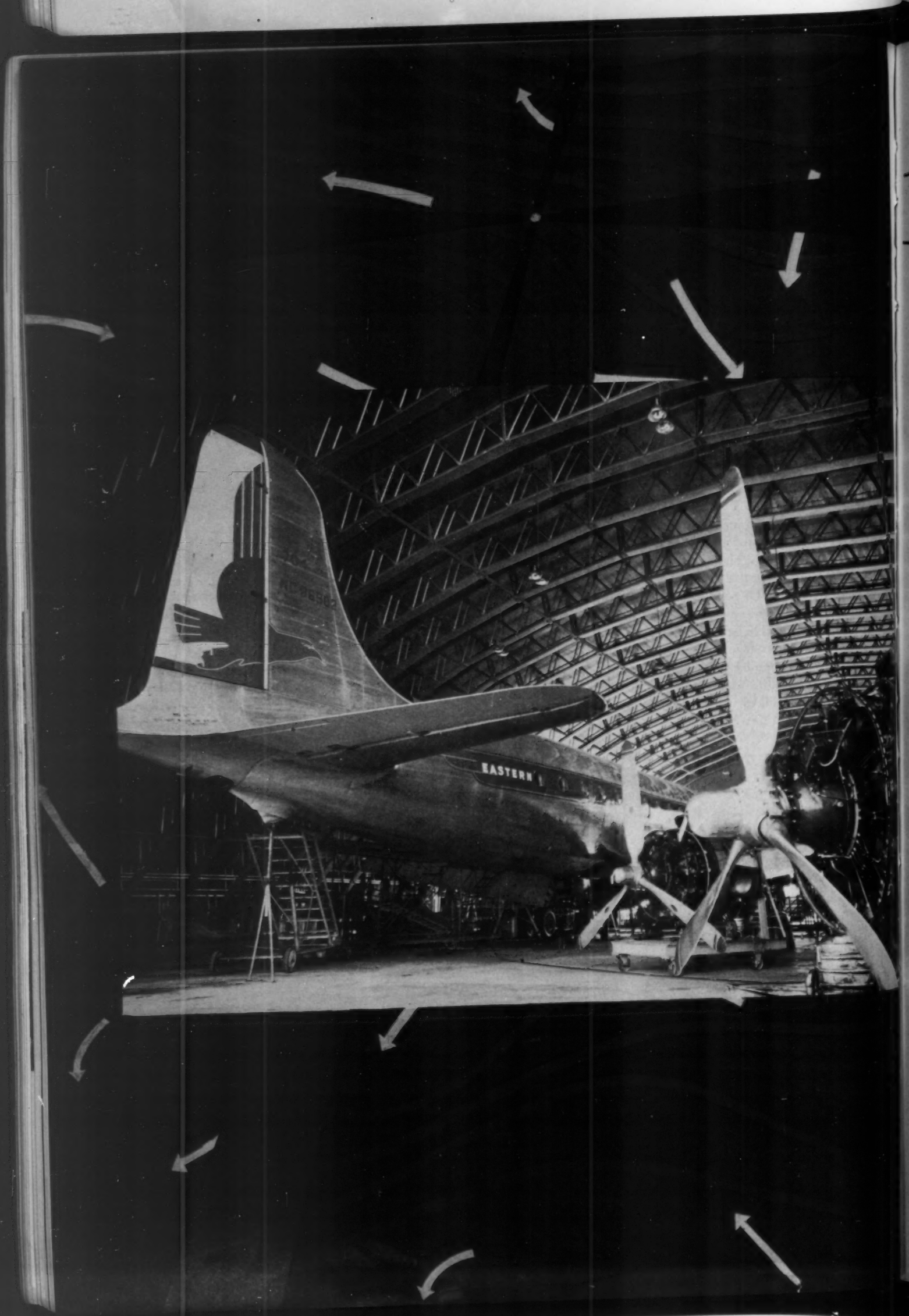
MR. SEVERUD: I asked because free-standing hangars are much more economical to build if they are self-bracing; and circular forms (page 122, 7, 8) are vastly more efficient in this respect than rectangular ones.

DRAMATIS PERSONAE: Mr. Kneisel, left, maintains port facilities for Pan-American; Mr. Severud, center, has designed big hangars around the world; Mr. Abramovitz, right, already known to readers as an architect, operated wartime flying fields in China

Pan American World Airways Photo

Conway Studios Photo

Official United Nations Photo


EASTERN

HANGARS ANALYZED

By Fred N. Severud, Consulting Engineer

FOLLOWING on the foregoing discussion (pp. 111–113) of the need for covered areas in which to work on airplanes, it becomes important to know in just what way the areas can be covered most economically and with the desired qualities for maintenance and possible fireproofing.

We are dealing here with large hangars. Small ones are a chapter in themselves. When, therefore, we speak of spans and areas we mean those which are relatively large.

Fireproofing

There has been some debate about the economics of fireproofing, since insurance rates do not show as pronounced a differential as one might expect between fireproof and non-fireproof construction. However, there is still the factor of enormous delay to be considered by the airline which loses a big hangar as well as the contents in hot gasoline fires, regardless of whether costs are covered at the same rate or not.

Recent tests have shown that vermiculite plaster is an extremely efficient protection against fire. Other means are also available for fire protection, such as ceiling formed of gypsum planks laid on fireproofed tees that, in turn, are hung from the roof construction.

We need not, therefore, let our review be too much concerned with whether the basic structure in itself is fireproof. An inherently fireproof system can be considered without disadvantage in comparison with one which has less intrinsic fire resistance but which has been given a separate protection to bring it up to an equal fire resistance rating.

Use of Space

The quick assumption that any large hangar must preserve its interior space entirely free and clear of obstruction is one that has been made very generally; but any airline which does *not* expect to expand the size of its planes indefinitely (and there are many which, on account of the distance between stops, have surely come close to the economic maximum in plane size) will increasingly consider every item of waste and excess cost with the greatest care.

We must therefore pay close attention to those means of *reducing spans*, or *reducing height*, or finding interior *points available for supports*, which can bring down the enormous excess that is imposed by mere habit.

NEW STRUCTURAL FORMS SHOWN

1	Washington Airport hangars	Page 119
2	"Box-car" hangar	120
3	Nose hangar tightly closed	120
4	Diagonal-truss hangar	121
5	Cantilevered barrel vault	121
6	Crane-erected concrete arch	121
7	Precast ring circular hangar	122
8	Spiral structure, precast units	122
9	Slanted truss, cantilevered	123

Existing Types of Support

In order to come to grips with the problem quickly, it would seem wise to parade the present systems which involve large spans, and put in a word of comment on the merits and demerits of each. In order to do this succinctly, some 19 different types have been tabulated on page 118.

In order to give a quick visual impression of the types habitually used for different sizes, we have assembled examples of the leading ones (next page), mostly from our own practice, and reproduced them to equal scale.

A few preliminary remarks may be in order.

Concrete Shells

Where there is exact repetition, concrete shell hangars have recently been popular. It seems that the first cost of construction, even despite the inherently considerable expense of form-work, compares quite favorably with other types. This form-work is made for only one bay and is so arranged that it can be jacked up for pouring, then lowered and moved on tracks from bay to bay. When one hangar is finished, the forms are moved outside and sidewise, and then into the next hangar.

One disadvantage of hangars constructed in this manner is that weather is a severe handicap. It is obviously impractical to provide an enclosure under which to pour concrete in cold weather. The whole construction is

FRONTISPIECE. The high tail is what makes the hangar have to be so high. Cheaper construction is possible where high areas can be confined. Note entire "power eggs" removed onto dollies

Wide World photo

therefore subject to delays and the method is not too speedy in itself. (Enthusiasts for this type may have some grounds for their counter-arguments if delivery of structural steel is delayed and prices are jacked.)

Steel Tonnage: Straight Forms vs. Rounded

There is an interesting difference in steel tonnages required by three-hinged arches as compared to rigid frames. On a three-hinged arch roof that we designed for a 275-ft. span, the structural steel, including bracing, came to 22.5 lb. per sq. ft. Another hangar having a somewhat shorter span of 264 ft. and a rigid frame took 38.8 lb. of steel per sq. ft. In general, *it may always be stated that economy of material always follows rounded structural forms such as arches, shells, and domes.*

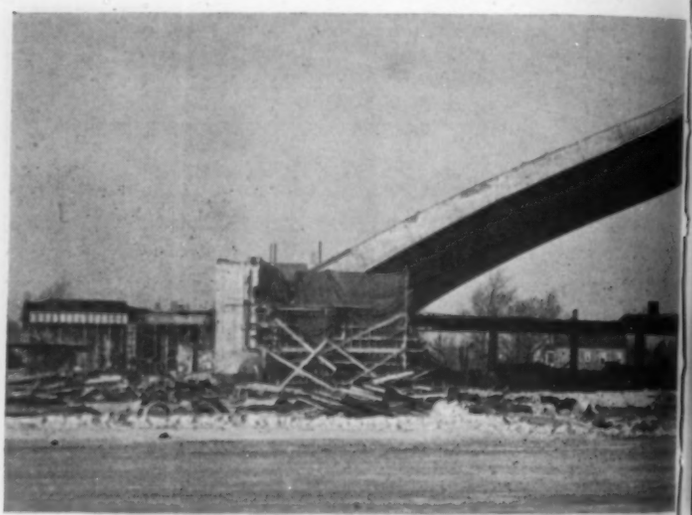
Tie Rods vs. Self-braced Structural Forms

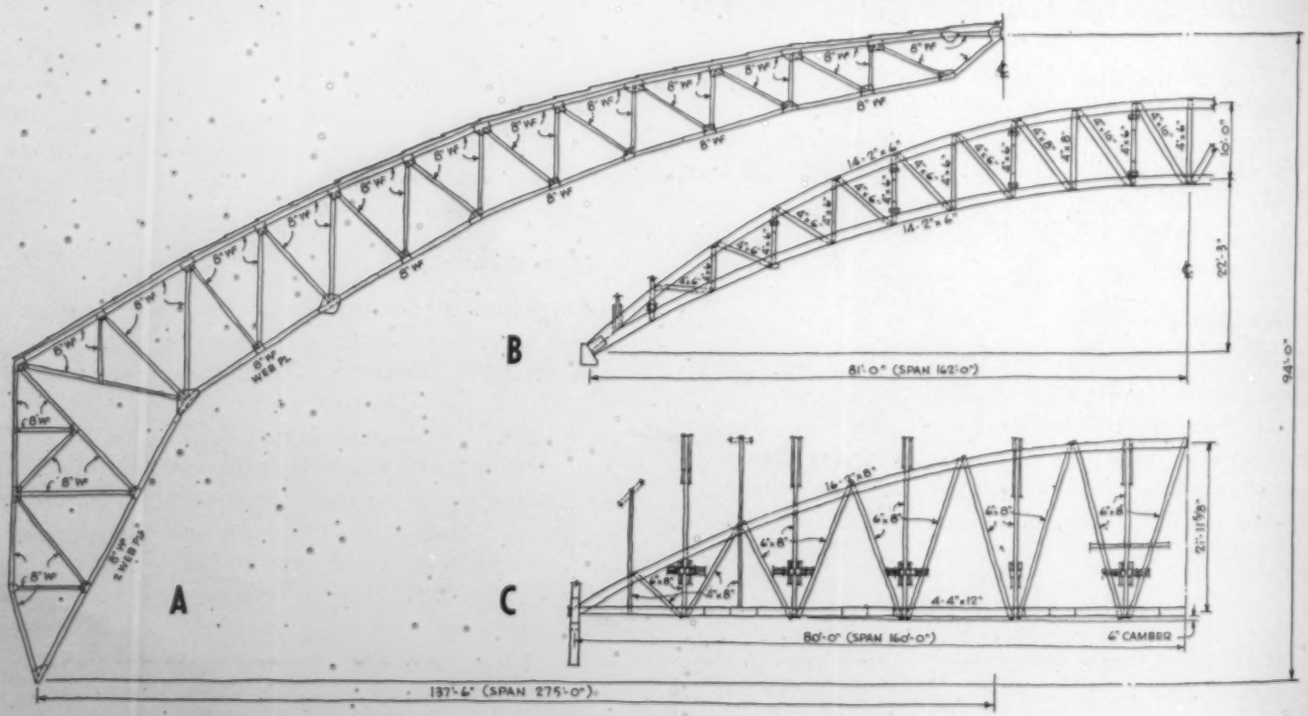
As noted in the table, tie rods are objectionable. They are the most efficient means of resisting lateral thrust under conventional construction methods, but they do restrict the mechanical work considerably, and should be avoided, if possible, in order to facilitate possible future rearrangement of underfloor tunnels. If tie rods are eliminated from structures exerting sidethrust, this thrust must be resisted by buttresses. Eventually the side thrust finds its way into the ground and is resisted there. We have made studies of the effect of unequal settlement on long-span construction and have found that in one case a 16-in. differential settlement could be tolerated with no more than a 10 per cent increase in stresses. Of course, such a large settlement has a highly objectionable effect on side walls and roof and is mentioned only to show that small settlements will have practically no effect on the arch construction. However, hangars are often built on questionable ground and it may well be that, in certain cases, tie rods should be used to prevent a spreading of the arch.

Structurally, by far the most efficient form is the ring-shaped dome, which resists lateral thrust within the structure itself. Although Mr. Kneisel, on preceding pages, has raised objections to the circular hangar on grounds of access, the shape may be indicated under some circumstances and may serve very well in shops, so a proposal of this type is explored in the latter part of this article.

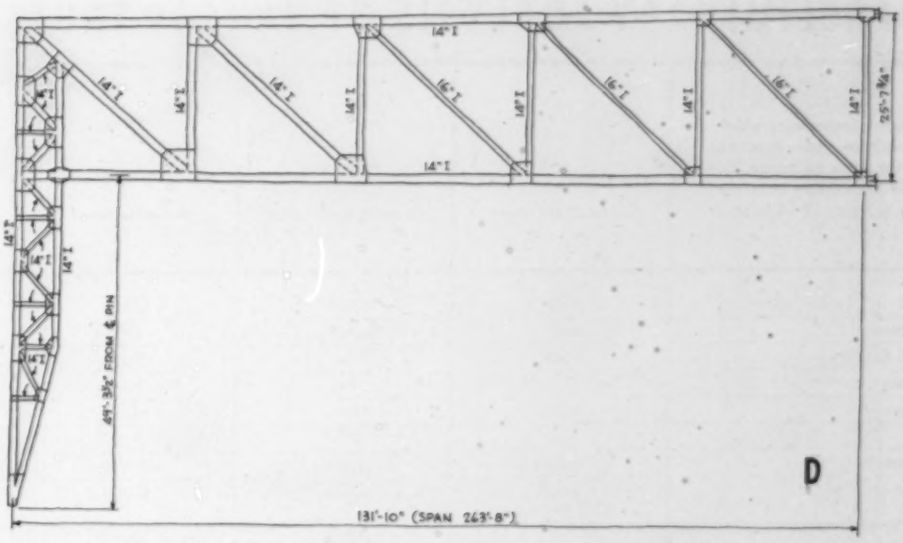
A complete analysis of hangar construction would take in numerous components such as roofing, siding, insulation, door types; but this study seeks only to outline the broad structural features. We therefore follow up the analysis of existing types with some thought-provoking proposals.

COMMON FORMS

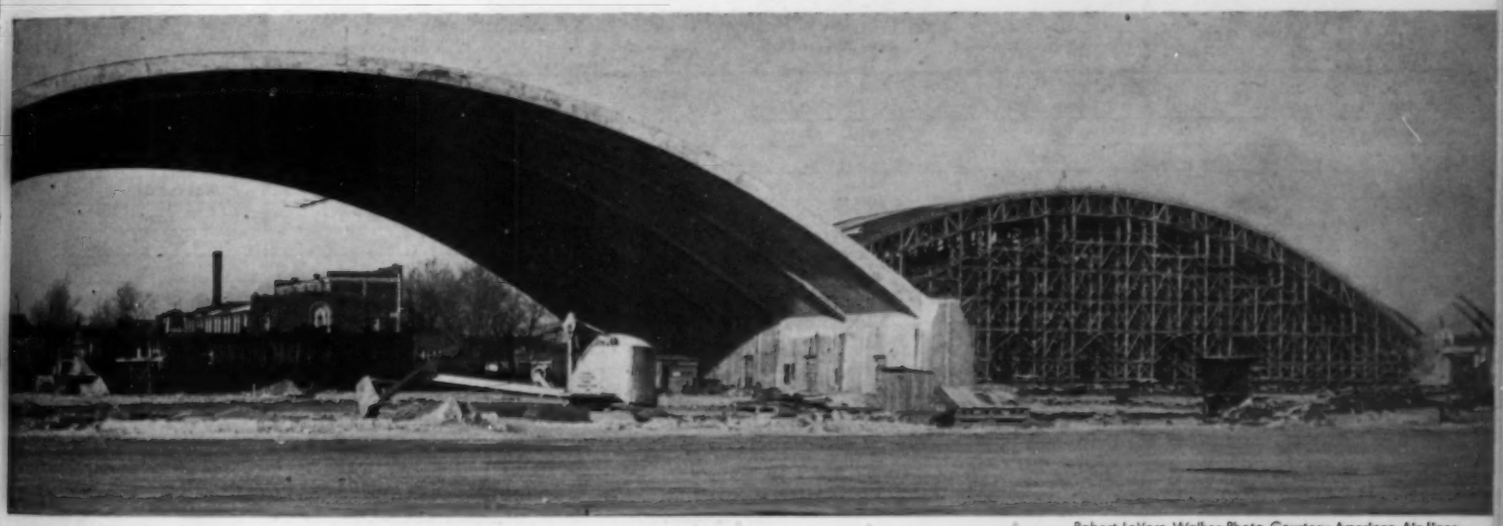




*A parallel-chord steel truss structure (**D**, right) is available for large spans, cuts down height, heating, wind resistance, but consumes more material compared with the three-hinged steel arch (**A**, opposite page). The small crescent wooden arch (**B**) requires either tie rods or buttresses; in the bow-string (**C**) the tie-rod is integral but the truss consumes more space*

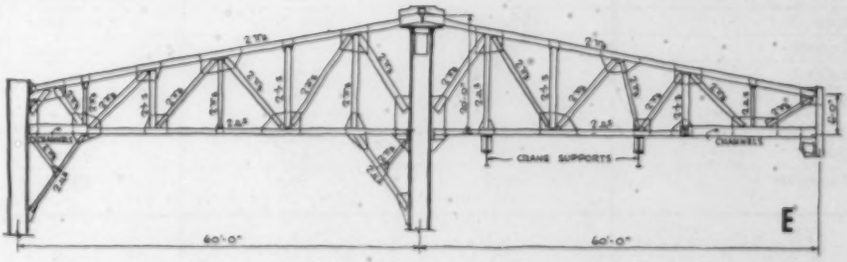


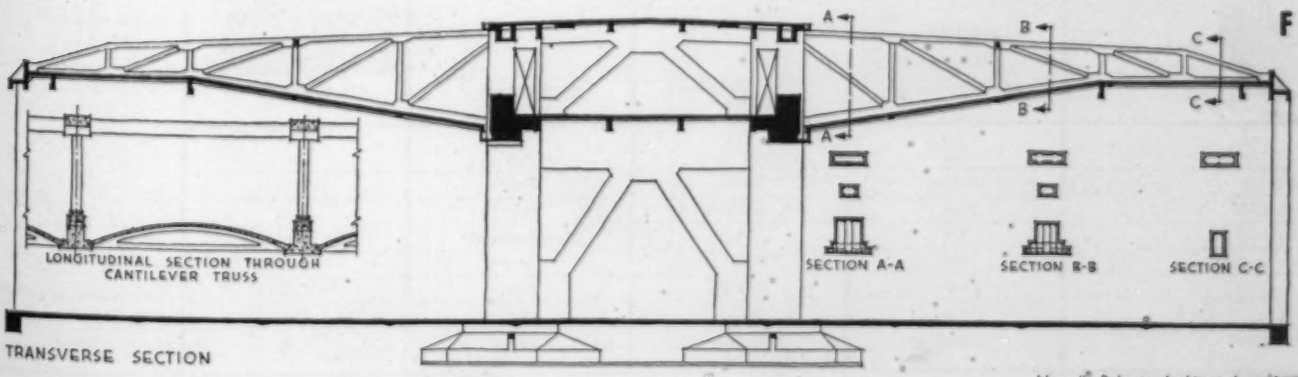
OF HANGAR STRUCTURE SHOWN TO EQUAL SCALE



Robert LeVern Walker Photo Courtesy American Air Lines

*Concrete hangars seen above are in Chicago for American Air Lines, by Whitney and Ammann, engineers. Slab is on the neutral axis of the ribs, creating an economical, more flexible structure. Buttress area provides shop space. (Span, 257 ft.) Cantilever trusses seen at right (**E**, steel, **F**, concrete) are short in themselves but allow endless lateral spans*





Marcello Roberto, Architect, Argentina

PRELIMINARY ANALYSIS OF HANGAR TRUSSES

By Fred N. Severud, Engineer

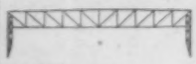
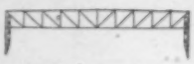
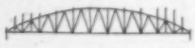
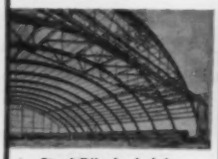
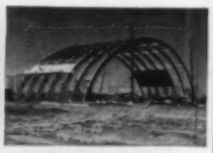
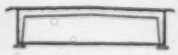
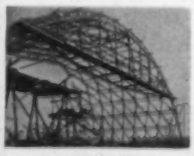
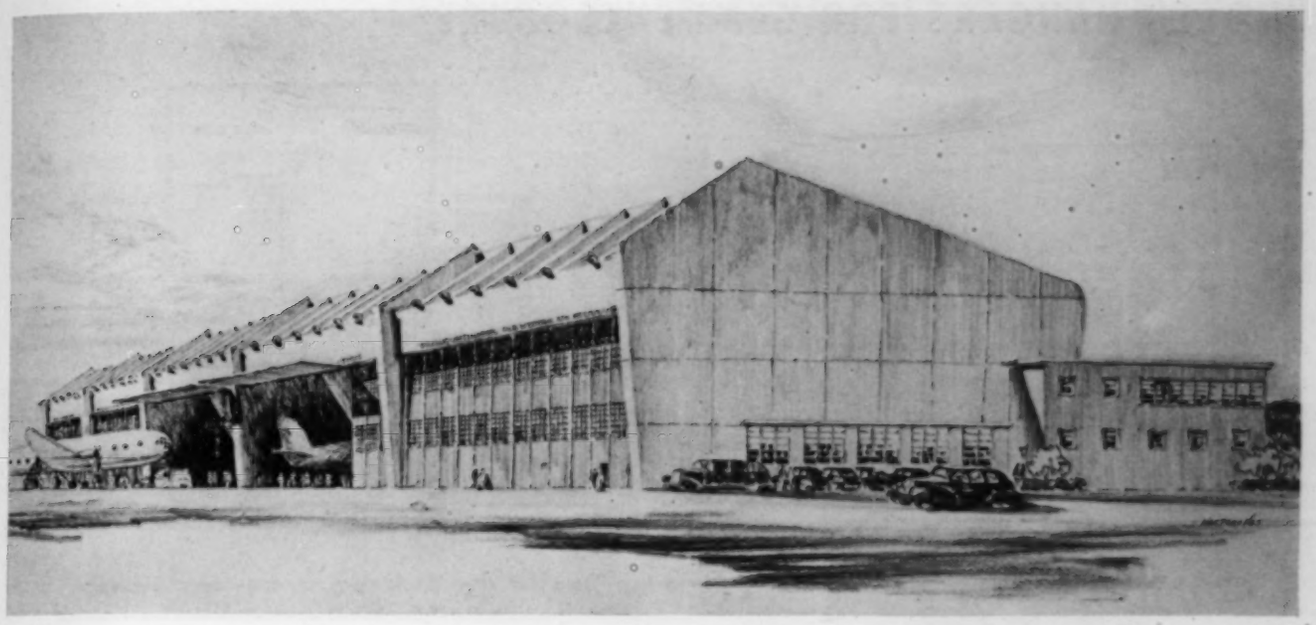
NOTE: Circumstances vary widely making each of these structures the best for some purposes. This analysis is preliminary only, applying to hangars of wide span	 Parallel Chord, Wood	 Parallel Chord, Steel	 Bowstring Wood	Bowstring Steel	Steel Arch
First Cost	Fair	Fair	Good	Good	Very good
Maintenance	Fair	Painting	Fair	Painting	Painting
Fireproof Quality	Poor	Poor	Poor	Poor	Poor
Ceiling req'd	Non-Fireproof	Yes	Non-Fireproof	Yes	Not customary
Side thrust	None	None	None	None	Tie rod or abutment
Bracing	Fair	Good	Poor	Poor	Good
Roof height	Great	Great	Great	Great	Low
Speed of erection	Good	Good	Good	Good	Good
	Three-hinged Arch, Steel	 Steel Rib Arch (a)	 Laminated W. Arch (b)	Crescent Arch Wood	Crescent Arch Steel
First cost	Very good	Very good	Good	Fair	Fair
Maintenance	Painting	Painting — less area	Fair	Fair	Fair
Fireproof quality	Poor	Poor	Poor	Poor	Poor
Ceiling req'd	Not customary	Not customary	Non-fireproof	Non-fireproof	Not customary
Side thrust	Yes	Yes	Yes	Yes	Yes
Bracing	Good	Good	Good	Good	Good
Roof height	Low	Low	Low	Great	Great
Speed of erection	Good	Good	Good	Good	Good
	Rigid Frame, Steel	 Rigid Frame, Concrete	Concrete Shell, Roberts & Schaefer	Concrete Shell Whitney (c)	Single Cantilever
First cost	Fair	Fair	Good if repeated	Good if repeated	Fair
Maintenance	Painting	Very good	Very good	Very good	Painting
Fireproof quality	Poor	Very good	Very good	Very good	Poor
Ceiling req'd	Yes	No	No	No	Yes
Side thrust	Small	Small	Yes	Yes	No
Bracing	Good	Very good	Very good	Very good	Fair
Roof height	Low	Low	Low	Low	Great
Speed of erection	Good	Slow	Slow	Slow	Good
	Double Cantilever, Steel	Double Cantilever, Concrete	Wood Lamella	 Steel Lamella	
First cost	Fair	Very high	Fair	Fair	
Maintenance	Painting	Good	Fair	Painting	
Fireproof quality	Poor	Good	Poor	Poor	
Ceiling req'd	Yes	No	Non-fireproof	Not customary	
Side thrust	No	No	Yes	Yes	
Bracing	Poor	Good	Fair	Fair	
Roof height	Great	Great	Low	Low	
Speed of erection	Good	Very slow	Fair	Fair	

Photo credits: (a) Bethlehem Steel, (b) Unit Structures Inc. (c) Robert LeVern Walker.

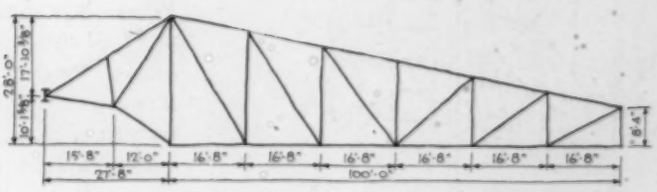


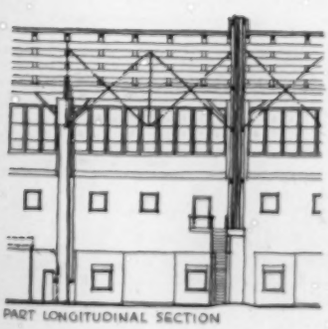
REDUCING ROOF AREA BY MASTER TRUSS

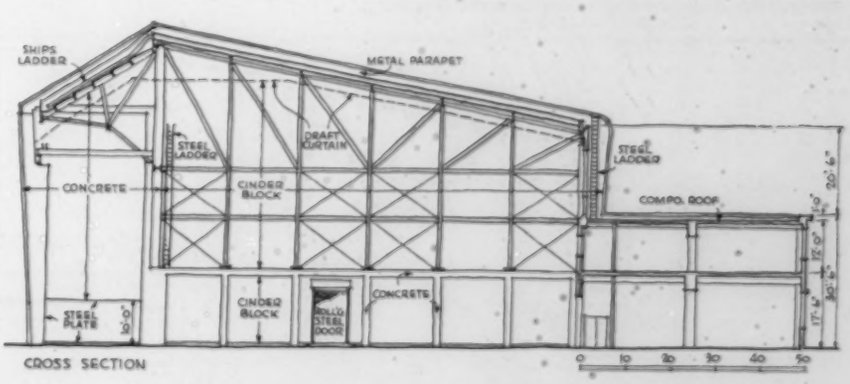
New hangars under construction at Washington National Airport

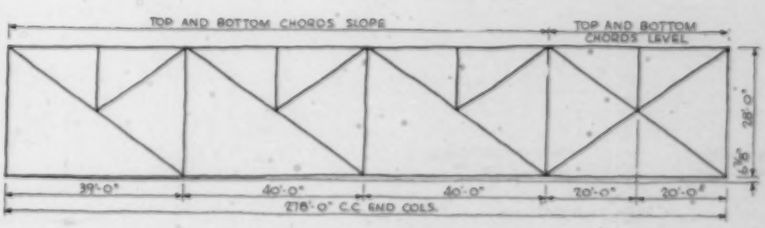
Public Buildings Administration, Architects and Engineers

The big **transverse** *truss (see diagram, bottom of page), which runs through under the ridge, is used to reduce the roof area and to hold* **longitudinal** *truss spans down to 100 ft.* **Longitudinal** *trusses (top diagram, right) are cantilevered from the ridge forward. The kick-up of this truss above the hangar door (see diagram) is a good idea, since the added height* **could** *be used to allow an extra opening for big tail fins if planes began to crowd the hangar in height (although it has not been so used here)*





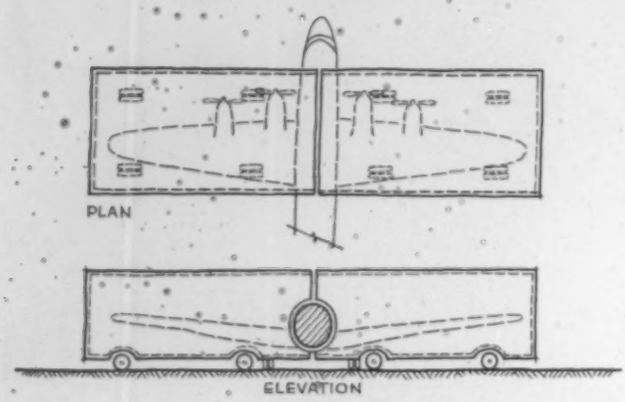


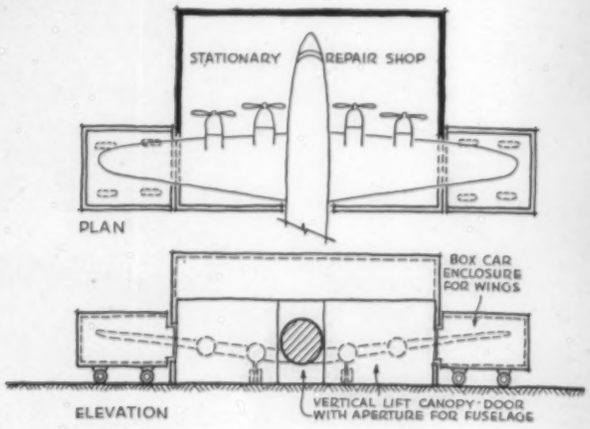


1

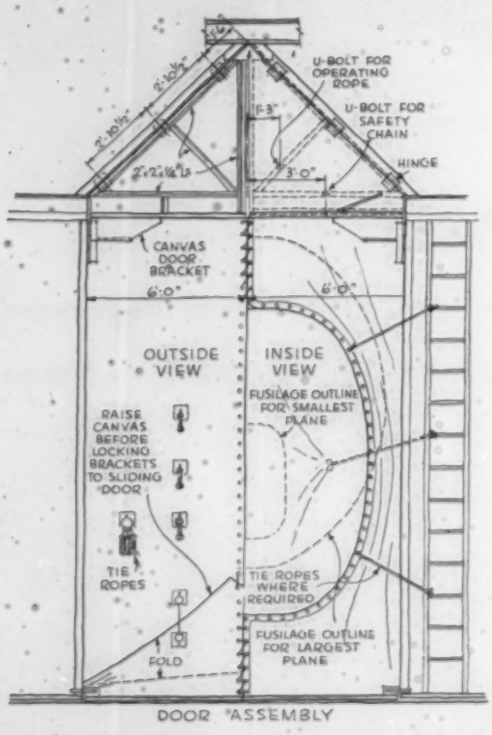
"NOSE" HANGARS FOR SEMI-ENCLOSURE

2





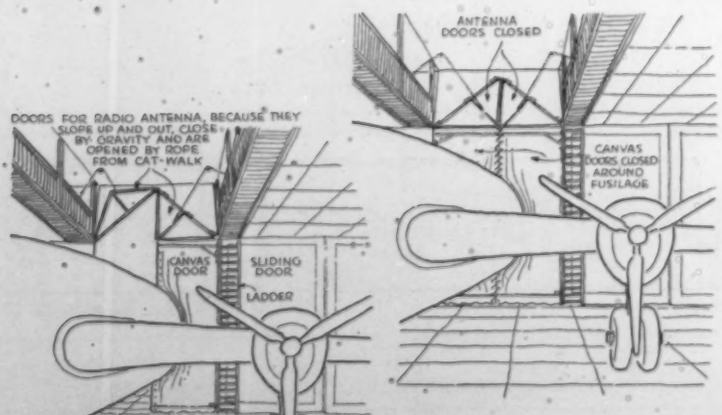
3

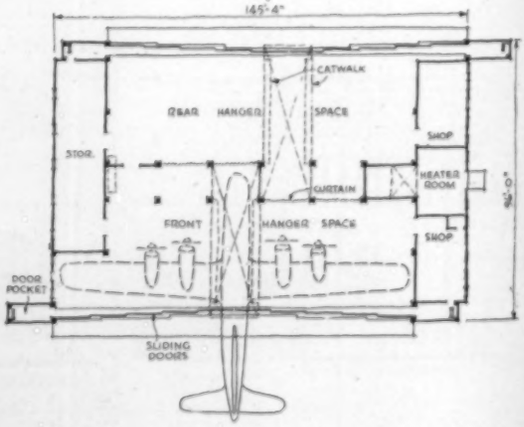


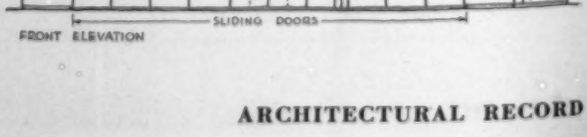
2 ***is a "box-car" arrangement;*** **3**, ***a nose hangar with tight doors***

Mr. E. G. Elstad of our office developed the two "box-car" schemes above. The simplest (left) consists of two huge cars or vans rolled together and closing above the wings. Variant at right shows permanent servicing dock, enclosure completed by box cars over wing tips. Height is reduced — no need to accommodate the tall tail; span reduced. Similar box cars could be pushed against tail, stabilizing it against high winds on rare occasions when landing gear is serviced with planes on jacks

Below and left: Nose hangar with tight closure around the fuselage. When empty, hangar is completely closed by steel doors. When plane enters, steel doors are stopped short at fuselage and final closure is made by a canvas curtain. This is hung on brackets attached to top and bottom of central door leaves and is swung shut. Small door in peak closes down obliquely against antenna of plane. If planes are to be tailed in, a much higher peak is required. This hangar is in actual use for limited repairs

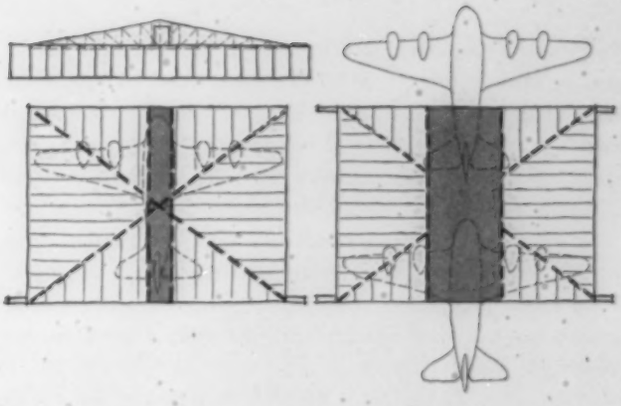






TRUSSES SHORTENED; CENTERING AVOIDED

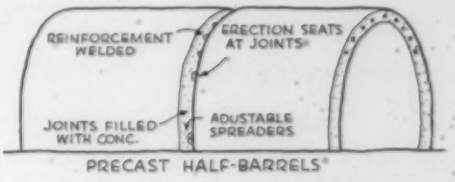
Here truss work is confined to two diagonals only. Remainder of steel can all be rolled members. For tailing in planes, diagonals must be high enough to clear tails. However, in a double hangar (right) the tail would not have to cross the center and it would be practical to use low diagonal bottom chords. In the double hangar, a good many columns could be introduced near the center so as to shorten spans without obstructing operation. In single hangar (left) plane enters from either side, can leave on opposite side

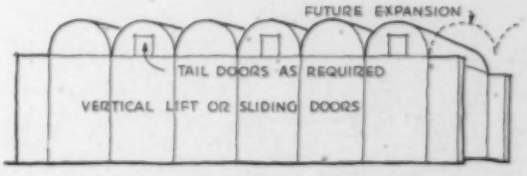


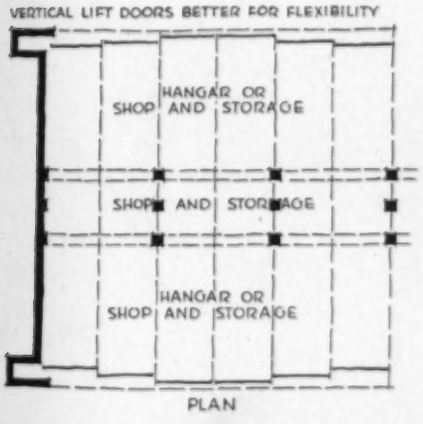
4

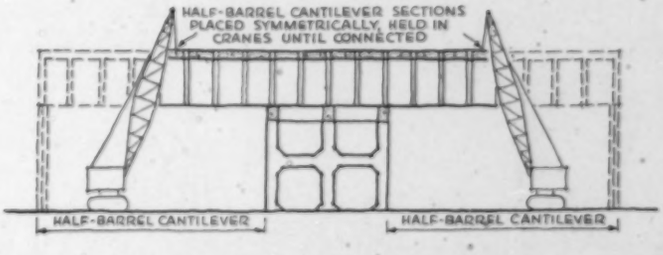
Double barrel cantilever in concrete

Here is a double hangar arrangement with shop space at the center, expandable indefinitely. Central posts are cast first. Precast concrete half-barrels are lifted by cranes symmetrically, held in place until reinforcing rods (projecting at the ends) are welded and joints filled, creating monolithic structure







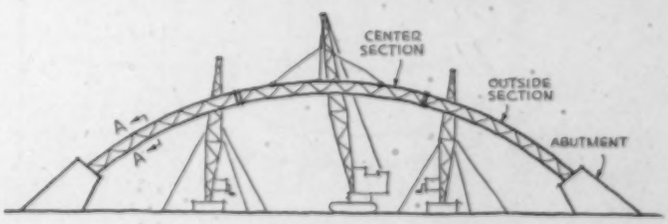

HALF-BARREL CANTILEVER SECTIONS PLACED SYMMETRICALLY, HELD IN CRANES UNTIL CONNECTED
HALF-BARREL CANTILEVER
HALF-BARREL CANTILEVER

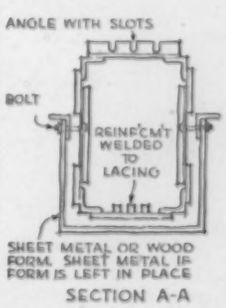
5

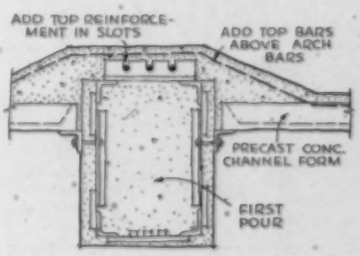
Concrete arches held by gin poles

This study eliminates scaffolding. Although the sketch shows a single crane, on large hangars it would be more economical to use two. After gin poles are guyed, the lower arch sections are lifted into place and attached to abutments. Gin pole continues to hold upper end in position, adjusted by separate winch.

The crane then erects the center arch section, holding it until connections are made at each end. For large spans, arch may have to be guyed; on small ones, gin poles give lateral bracing. Arch sections come with metal or wood forms attached (sketch), for concrete poured from crane bucket. Precast concrete channel forms span from arch to arch supporting final roof slab. Their reinforcement is sufficient to resist stresses during pour. Further reinforcement stiffens final slab



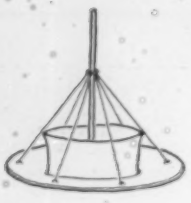


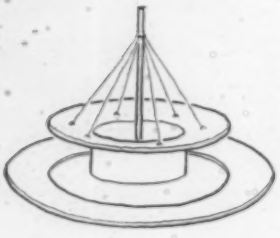


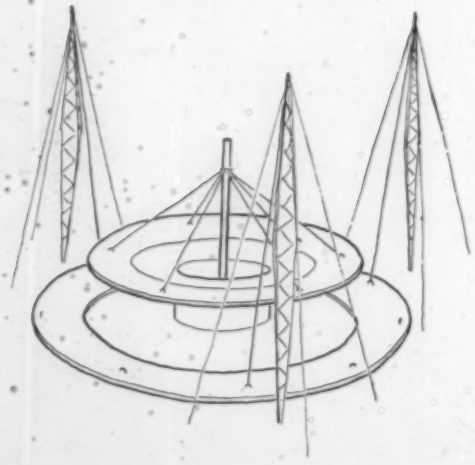
6

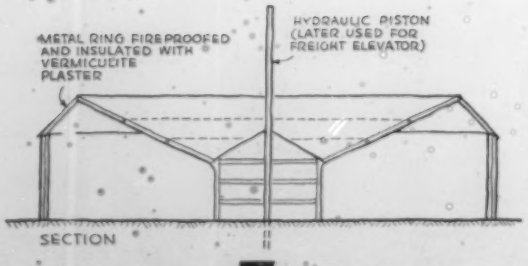
CIRCULAR FORMS FOR GREATER STRENGTH

This radical departure from ordinary methods relies on the greater intrinsic strength of circular forms, and on efficacy of road-building techniques. The central shaft seen in the sketches might be a hydraulic piston. A complete ring of concrete is precast on the ground, like pavement, then lifted into position, and its radial reinforcing welded to that of the previous ring. Successive rings, cast on the ground, may require gin-pole hoisting. In the ascending shell the stresses are ring tension and radial compression. In the final, descending section they are reversed, so this may be more practical as light steel, fireproofed with vermiculite plaster



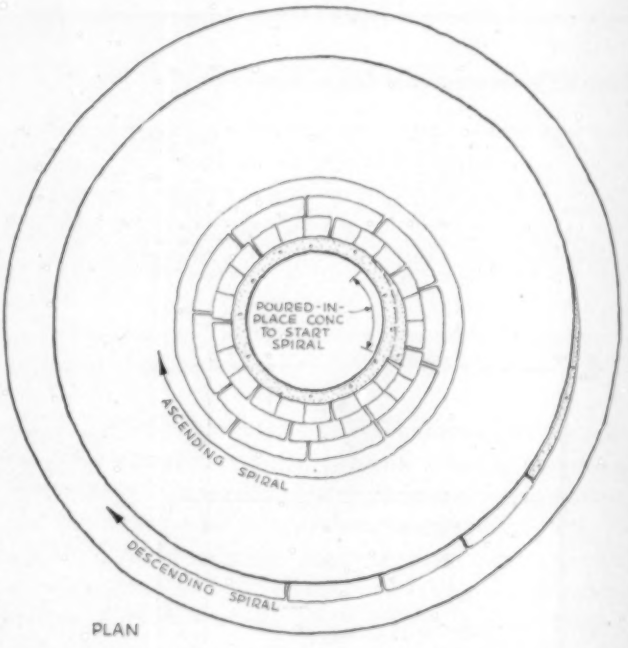


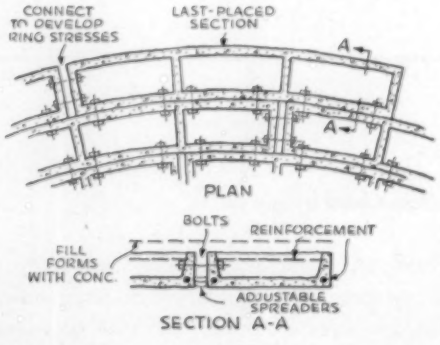



METAL RING FIREPROOFED AND INSULATED WITH VERMICULITE PLASTER
HYDRAULIC PISTON (LATER USED FOR FREIGHT ELEVATOR)
SECTION

7

Again, borrowing from experience in prestressing concrete tanks, it is possible to work around and around a spiral, lifting up successive small precast units and bolting and grouting as the work goes forward. A certain amount of torsion is developed but these stresses are so extremely small that they may be neglected almost entirely. The units are reinforced for the ring stresses produced by the tendency of the ring to burst. Crosswise reinforced ribs make the unit strong enough to be bracketed out from the adjacent section. Loose contact between units permits the same shape to be repeated, with safety, throughout the spiral. Identical units, and no falsework, for economy





8

MAINTENANCE SHOPS RELATED TO HANGAR

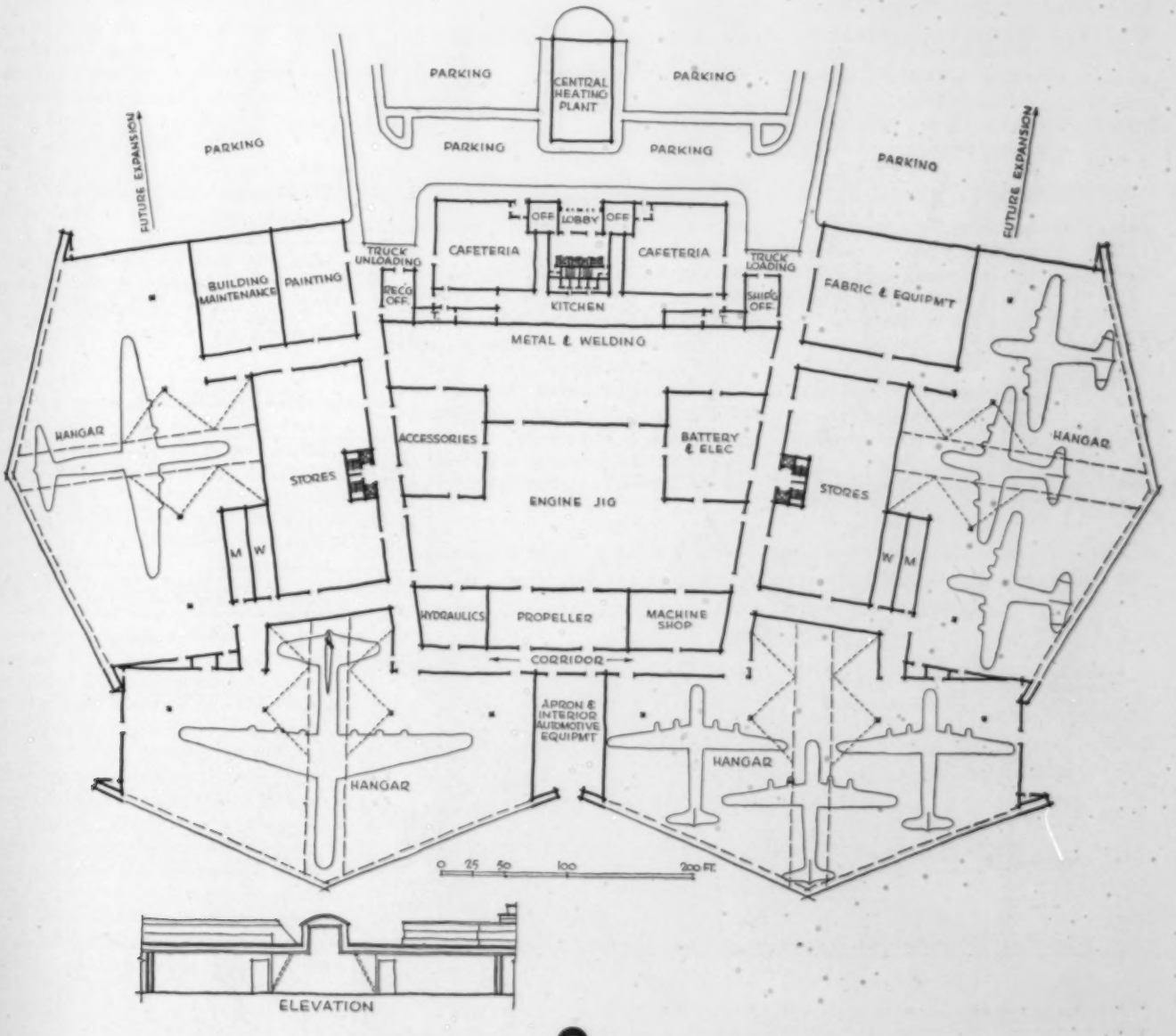
The plan seen below is from a preliminary study of a proposed hangar and shop area at a major airport. This study was prepared by George Fred Pelham, Architect, with our firm as structural consultants. Even in the short time that has elapsed since the study was prepared, certain modifications must be made to correspond with more recent thinking of airline officials. The main purpose in presenting this study is to portray the balance between hangar shop and storage areas, and the relative locations between shops for various activities. A secondary purpose is to portray also a system for the framing of hangar roofs that embodies novel features. By selecting points for interior columns that will not interfere with the functions of the hangar, means have been found to support a good portion of the hangar roofs on sloping cantilever trusses. *These trusses provide the necessary tail height for complete enclosure and give support to a framing system that consists of rolled sections only. As will be seen in the part elevation, the hangar roofs become extremely low in comparison with the usual big arch, saving in heat and maintenance and adding sightliness.*

The steel per square foot in this particular design is 25.8 lb. Most of this steel is rolled beams, and therefore carries a low tonnage cost. Even the tonnage itself compares favorably with the steel tonnage for hangars with much smaller span and much more truss or arch work.

A warning must be issued against copying such a design as a whole, since requirements vary enormously from airline to airline, and access varies greatly from port to port.

The principle is established, however, that a big hangar should not be merely an enlargement of a small one. Once the operators have settled down in regard to fleet makeup and operational routine, there are bound to be "dead" spots within the hangar available for structural support. Unlimited clear space is a costly luxury.

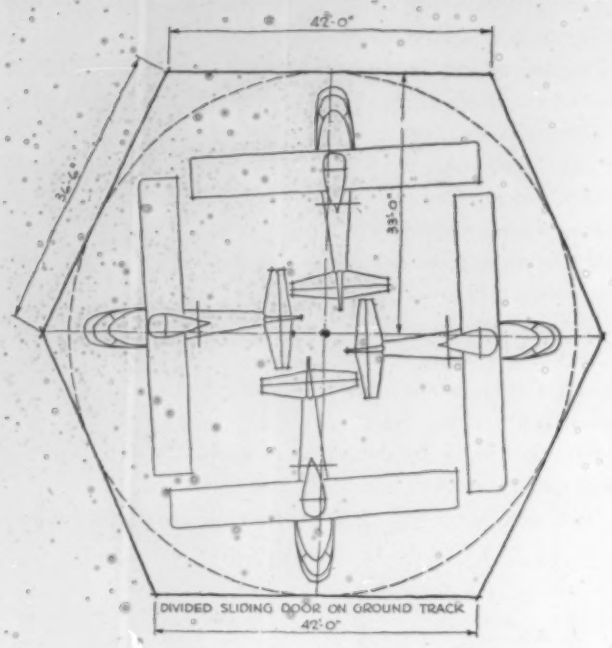
In future, shops may be located entirely away from hangars,



9

COMPACT PARKING FOR PERSONAL PLANES

Mayer and Whittlesey, Architects. Patents applied for by T. O. Warfield



Basic in this scheme, for an operator renting sea-planes, is a single door for every four planes, by use of rotating platforms. Tolerances are close, plane being standard model. Plane is pulled by jeep to marked position on apron, tail toward hangar. Central winch pulls plane in, tail foremost, to accurate position, aided by rear-wheel guide. Compared to standard "T" hangars (third diagram below) much less space is needed. With T hangar, jeep pulls on through, needs a taxiway each side of hangar. On lot 200 ft. by 550 ft. the new "hex" arrangement parks 64 planes against 48 in T's. First rotating-floor parking hangar is understood to have been that of Slim Kidwell of Roto-Hangar, Inc., at Los Angeles

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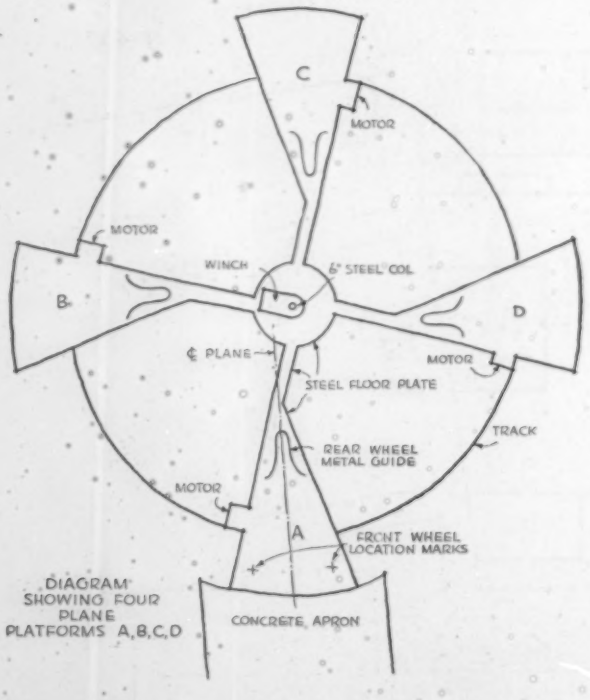
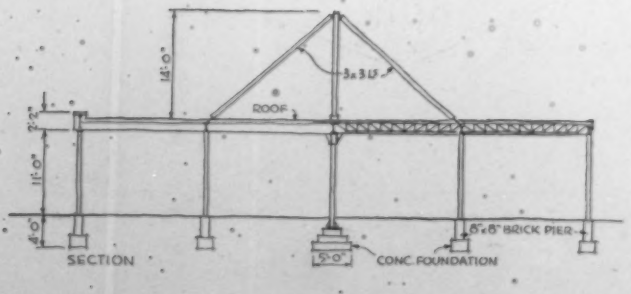
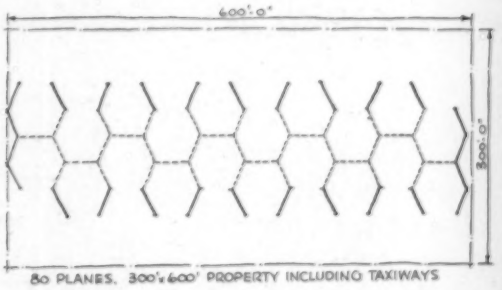


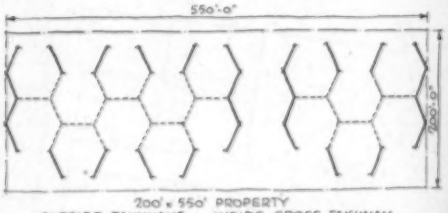
DIAGRAM SHOWING FOUR PLANE PLATFORMS A,B,C,D



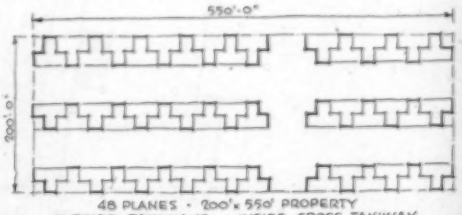
SECTION



80 PLANES. 300'x600' PROPERTY INCLUDING TAXIWAYS

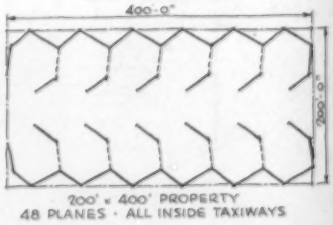


200'x 550' PROPERTY
OUTSIDE TAXIWAYS · INSIDE CROSS TAXIWAY

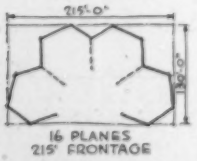


48 PLANES · 200'x 550' PROPERTY
OUTSIDE TAXIWAYS · INSIDE CROSS TAXIWAY

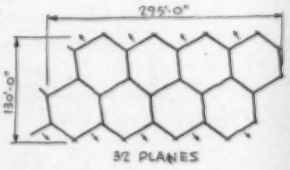
TRIANGULAR PROPERTY
32 PLANES



200' x 400' PROPERTY
48 PLANES · ALL INSIDE TAXIWAYS



16 PLANES
215' FRONTAGE



32 PLANES

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

A MULTI-STORY GARAGE FOR PUBLIC PARKING

By Basil Yurchenco

and Eduardo Catalano,

Architects

Off-the-street parking is rapidly becoming a "must" in urban planning, due to increasing traffic congestion and parking restrictions. Yurchenco and Catalano, who developed the Spiralway* ramp parking principle for a General Motors design competition for dealer establishments, here present a comparative study of multi-story garage systems

Object: A multi-story structure which will most efficiently answer today's great need for adequate car parking facilities in cities.

Requirements: For adequate performance such a structure must provide:

1. Economical relationship between parking and driving areas.
2. Ease of maneuvering cars between floors and into parking stalls so that the average driver can park his own car.
3. For control, one centralized and ample means of entrance and exit of traffic, with no impeding factor upon smooth traffic flow.
4. Accommodations for pedestrian traffic.

What type of multi-story structure best answers these needs? The modern automobile is an "outdoor vehicle," comparatively independent of temperature and weather conditions. Its only environmental requirements for efficient operation are evenness of road surface and sufficient space in which to maneuver. In short, the modern automobile has been designed for the street and highway, and we believe that the storage structure which most closely resembles the street is the best solution to the parking problem. This should produce a new type of building which in a vertical sense extends the horizontal advantages of the street. In the "Spiralway" the floor area, exclusive of central core, consists of a continuous ramp upon which cars may be parked. No space is relegated to the conventional steep ramp joining horizontal floors since the entire floor area is an ascending ramp of much lower slope. A slope averaging 2 per cent rise is possible within efficient garage areas.

HUMAN FACTOR

Maneuverability is more important than distance in the parking areas. The car travels under its own power, and the driver does not object to the distances involved in parking. Once the car has been parked, however, he would like to get out of the building as quickly as possible. In the "Spiralway" garage the central core can be utilized for stairs or passenger elevators giving quick egress to the street.

Of the total garage capacity, one may expect as much as 60 per cent of the traffic load to be concentrated in the early morning and late afternoon.

There has been considerable discussion about the practicality of self-parking units large enough to house 2000 or more cars at one time. If a hundred cars per floor is the economical maximum, this implies a 20-story structure. We feel that eight stories would be the highest number of convolutions a person would care to drive. This figure can be bettered, however, by extending the ramp three or four stories below ground level, bringing the total to 12 stories or 1200 cars. Additional stories could be planned above for long-term parking.

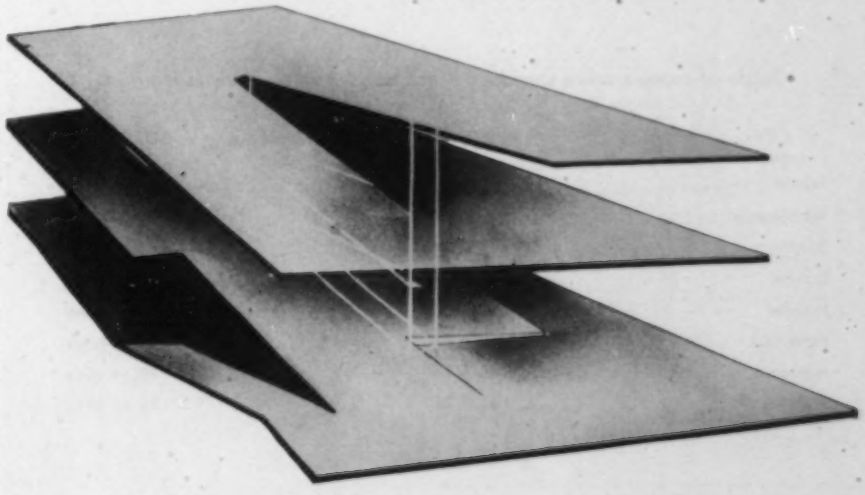
OTHER DESIGN CONSIDERATIONS

The greatest criticisms of existing parking garages have been:

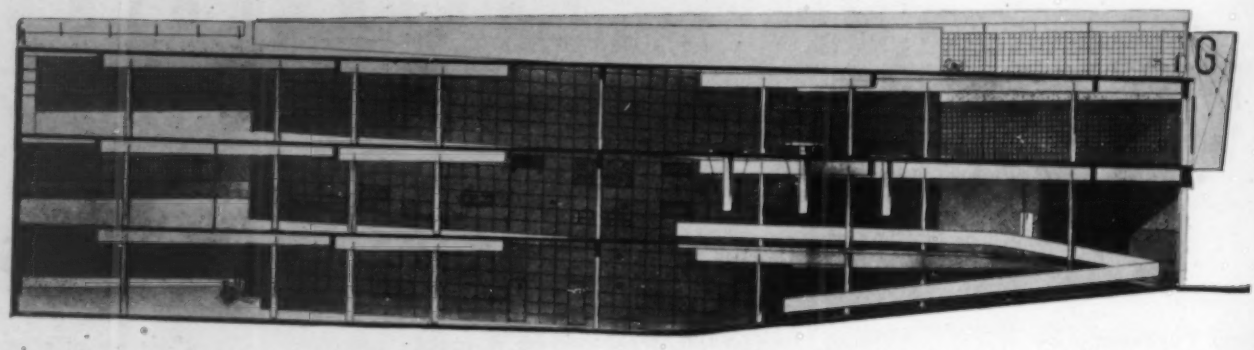
Inflexible structures because of small slab spans
Narrow driveways
Narrow stalls
Steep slopes
Broken-up floor areas
Lack of pedestrian walks
Sharp turns

While walls and heating provisions

In a parking garage, the entire floor area, exclusive of central core, would consist of a continuous ramp. Continuous ramp parking floors can be seen in this perspective of a dealer establishment designed for a General Motors design competition



*Patent applied for



Another view of the "Spiralway" ramp parking principle applied to a G.M. dealer establishment. Low slopes permit parking on the ramp

will not be necessary for the average parking garage, an additional original investment in installed pipe for radiant heating and conduits for carbon monoxide elimination, would make it considerably easier and cheaper to convert to a repair garage at a later date. A car washing tunnel would be a desirable service feature.

The use of roof area to compensate for loss of serviceable floor areas due to driveways has long been recognized. Another point is the need for simplicity of floor identification — possibly through the use of color.

SITE FACTORS

In many cities, the locations of multi-story parking garages will be based on over-all urban planning. Central location, and the simplicity and ease of well-planned accommodations should help eliminate the present disorder of the downtown parking lots.

The variety of sites on which multi-story garages have been built emphasizes the fact that no existing standard property subdivision takes into account the requirements of an effective parking system. The accompanying table illustrates the range of lot dimensions and the sizes of blocks in various cities.

STALL AND DRIVEWAY DIMENSIONS

A stall dimension of 8 ft. by 18 ft. is thought the best compromise between space economy and maneuverability and is used throughout this study as standard. In the past, for economic reasons, stalls often have averaged 6 ft. 10 in. in width, but only highly skilled garage attendants could maneuver cars into such areas. Considerable agility was required to get in and out of cars. The increased number of garage attendants required to park the cars made parking expensive.

Driveways should be some 22 to 24 ft. in width to permit untrammelled turning and parking. Within this width it is possible to have ample traffic lanes which should allow greater speed of car handling, and sufficient turning radii.

Available lot sizes influence the efficiency of multi-story parking garages

Table of comparative standard block and lot sizes in various cities

CITY	BLOCK SIZE	LOT SIZE
Toledo	240 X 480	60 X 120, with alley
Minneapolis	170 X 340	56 X 120, with alley
Seattle	108 X 240	60 X 108, with alley
Dayton	198 X 396	49 X 198, no alley
Houston	250 X 250	50 X 100, no alley
New York	200 X 800	25 X 100, no alley
Memphis	148 X 148	74 X 148, no alley
Indianapolis	120 X 285	71 X 120, no alley

FLOOR AREA

The combination of a driveway with right angle parking on both sides can be considered the simplest and most essential unit or design module. In a multi-story building this unit is usually indicated by the framing plan. Contemporary practice may tend to eliminate the 20- to 24-ft. span in favor of 60- to 64-ft clear spans.

The depth of the parking quadrant is the first resolvable factor, a sum of the following dimensions:

1st row of cars — 18 ft.
driveway — 24 ft.
2nd row of cars — 18 ft.

Next to be considered is the equally important corner quadrant which is the combination of the parking stalls and the driveway where it turns to join the opposite half of the floor. This is the area that most reduces the efficiency ratio of the structure.

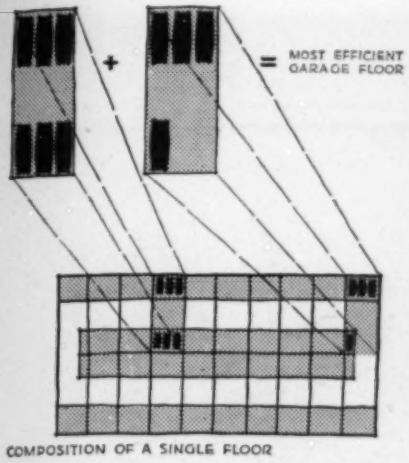
Of all types studied, the long-axis parking of cars on either side of the driveway with a 22-ft. turning area at the ends appears the most efficient. The continuity of the driveway in this instance again resembles the street.

A system that appears efficient in plan is the parking of cars around the four sides of the building. However, this is impractical because it necessitates the removal of adjoining cars in order to remove any of those parked in the corner areas.

SPACE EFFICIENCY

Property depth can be determined at an early planning stage, consisting normally of the depth of four parking stalls plus the two driveways, pedestrian lanes, and the central core.

There remains the question of building length for the most efficient relationship between the driveway and parking areas. From the four following studies it is found that the efficiency reaches its most workable maximum in a garage of about 175 ft. in length.



COMPOSITION OF A SINGLE FLOOR

Floor width is determined by the depth of 4 parking stalls plus 2 driveways. End units include turning driveway and therefore park 33⅓ per cent less cars

INTEGRATION OF LEVELS

The accompanying plans established the maximum efficiency of use of a typical floor. The moment that these floors are repeated one above the other, a number of problems are encountered.

The first and most typical solution is that in which floors are connected by ramp driveways. Because of the very nature of the structure, approximately 115 ft. of property length is required for approach and ramp driveways.

The second solution is the use of elevators which, when installed, are very efficient in space conservation but inefficient in time consumed in getting cars to and from parking stalls.

Some kind of helicoid ramp arrangement as demonstrated by "Spiralway" would appear to be an effective solution if the slopes can be kept within 1 and 4 per cent rise. Questions which arise are:

1. Would such slopes be satisfactory for parking? For years cars have been parked on streets with comparatively high crowns and slopes.

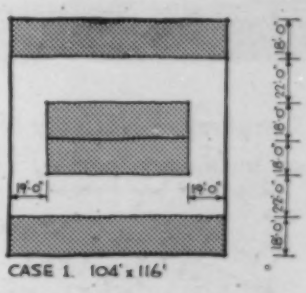
2. Can cars be serviced and repaired on a sloping floor? Yes, except for alignment jobs for which special frames are provided anyway.

3. Within what property dimensions can such garages be developed? The accompanying table gives lot sizes and related perimeters of ramps and their degree of slope.

The idea of using spiral floors for parking in garages is not new, having been introduced both here and abroad as attested by dozens of patents. Many earlier attempts have proved impractical, however, because they employed one centrally located generatrice, which produced square buildings and extremely high slopes in their inner perimeters. In the "Spiralway" system this problem is solved by using a number of generating centers located not in the geometrical center but where convenient. Planes meet in common tangents, producing one continuous floor level with extremely low slopes.

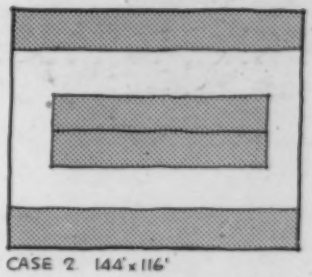
(Below) The most practical relationship between floor area and number of cars accommodated is shown by 4 case study plans to be about 175 ft. by 116 ft.

Case 1 (104 ft. by 116 ft.)
Floor area: 12,064 sq. ft.
Number of cars: 42
Area required per car: 287 sq. ft.
Efficiency: 50 per cent



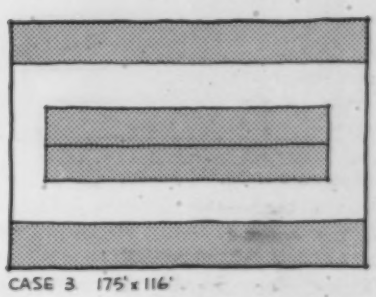
CASE 1. 104' x 116'

Case 2 (144 ft. by 116 ft.)
Floor area: 16,704 sq. ft.
Number of cars: 62
Area required per car: 269 sq. ft.
Efficiency: 53 per cent



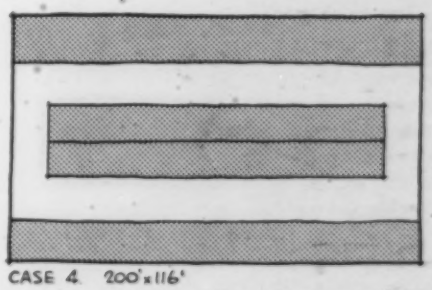
CASE 2. 144' x 116'

Case 3 (175 ft. by 116 ft.)
Floor area: 20,300 sq. ft.
Number of cars: 78
Area required per car: 260 sq. ft.
Efficiency: 55 per cent



CASE 3. 175' x 116'

Case 4 (200 ft. by 116 ft.)
Floor area: 23,200 sq. ft.
Number of cars: 90
Area required per car: 258 sq. ft.
Efficiency: 55.8 per cent

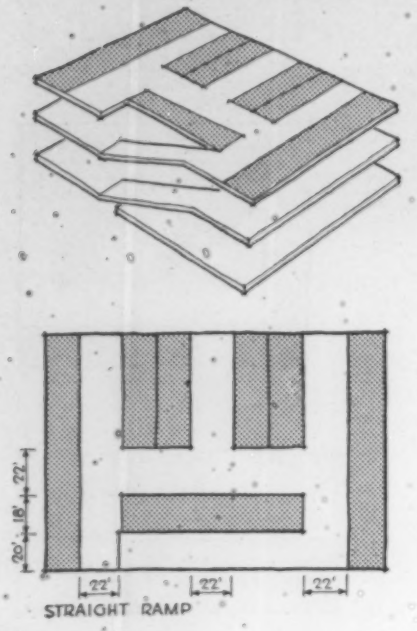


CASE 4. 200' x 116'

TABLE SHOWING DEGREE OF RISE OF RAMPED FLOORS WITHIN CERTAIN PROPERTY DIMENSIONS

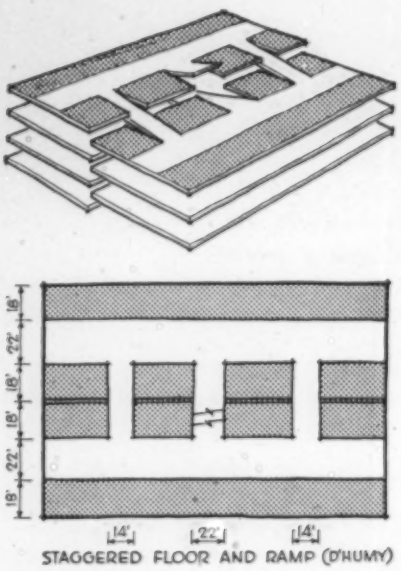
Lot Size	Floor-to-Floor Height	Outside Perimeter	Driveway Perimeter	Core Perimeter	Slope at Outside Perimeter	Slope at Driveway Perimeter	Slope at Core Perimeter
170′ X 140′	11′–0″	620′	430′	252′	1.78%	2.5%	4.4%
170′ X 140′	10′–0″	620′	430′	252′	1.6%	2.3%	3.8%
150′ X 140′	10′–0″	580′	424′	240′	1.7%	2.3%	4.2%
250′ X 150′	11′–0″	800′	610′	412′	1.38%	1.8%	2.7%

Comparative efficiency of floor areas of various types of multi-story parking garages, 175 ft. by 116 ft.



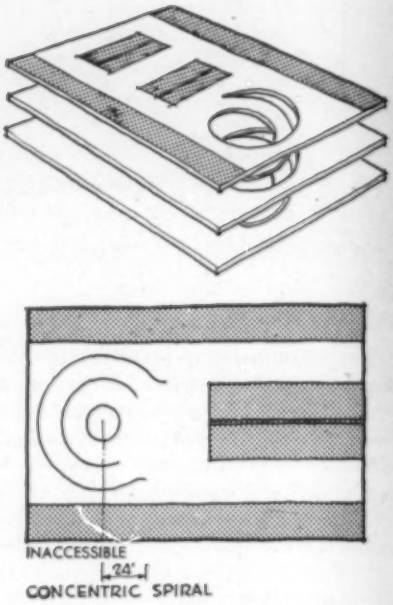
Number of cars: 68
Area required per car: 298 sq. ft.
Efficiency: 48 per cent

Too much parking space is sacrificed to the connecting ramp between floors

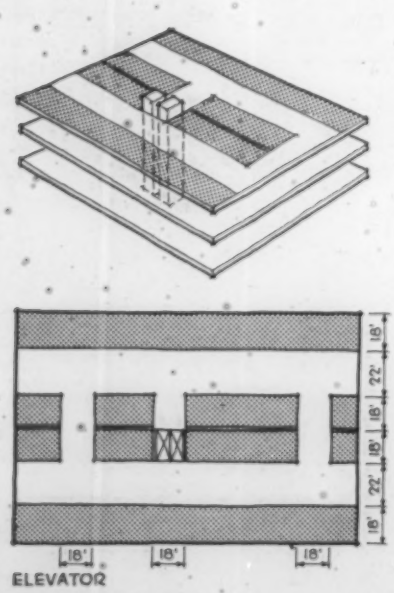


Number of cars: 76
Area required per car: 267 sq. ft.
Efficiency: 54 per cent

Most efficient of the horizontal floor systems. Comparatively short ramps

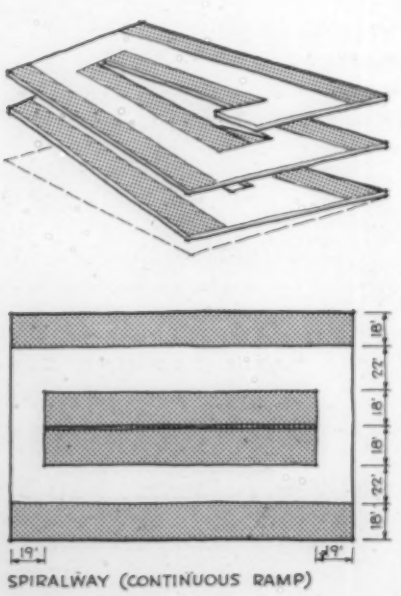


Not practical on lot of this size. (Diagrams show parking variants)



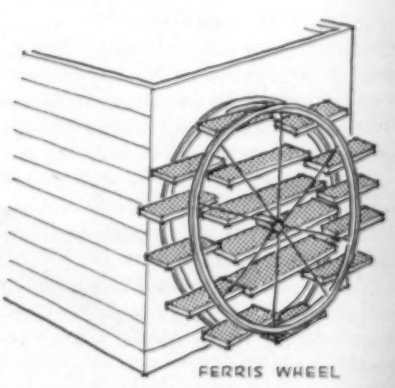
Number of cars: 76
Area required per car: 267 sq. ft.
Efficiency: 54 per cent

Slow handling of cars, and fire hazard. (Diagrams show parking variants)

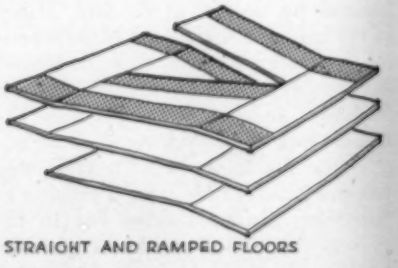


Number of cars: 78
Area required per car: 260 sq. ft.
Efficiency: 55 per cent

Best relationship between floor area and number of cars accommodated

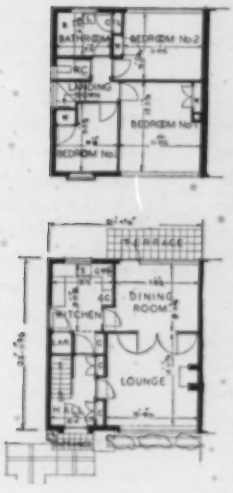


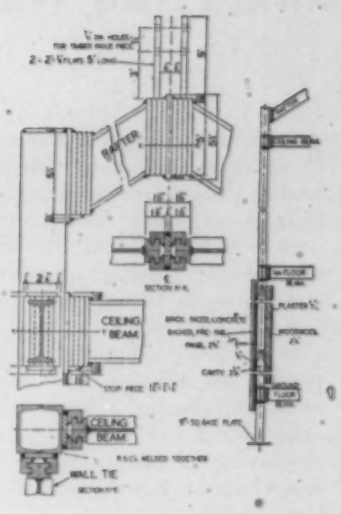
High installation and maintenance costs; contradictory demands made by safety factors and different people wanting to use the system simultaneously



A step in the right direction, but less practical than the continuous ramp floor

STEEL AND CONCRETE IN BRITISH PREFABS





BRITAIN emerged from the war with 4,500,000 houses, one-third of her total, destroyed or damaged. Current rebuilding programs call for 3,000,000 to 4,000,000 houses to be replaced by 1957.

To meet this schedule, British architects are designing basic housing types that can be built quickly and economically from mass-produced structural units and prefabricated wall sections. Two of these houses are shown on this page, the Cussins and the Airey.

The Cussins house, above, has a patented steel frame * (shown in the details), which is fitted with prefabricated brick wall panels. The panels are backed with concrete and have self-aligning connections. The interior is finished with insulation board and plaster. Erection time for a 2-family unit is about 14 days; cost, about $10,250.

In the Airey house, shown below, precast concrete posts are used as the chief framing members, to which are attached wall slabs of precast concrete, 3 ft. long, 9 in. wide, and about 1 in. thick. These slabs are laid in dry courses and secured to the concrete posts by copper ties. The slabs are tapered in section and fit together with overlapping horizontal joints. The vertical butt joints are backed with a bituminous seal. Greatest weight of the precast concrete units is only 36 lb., a weight that can be handled by the average workman without special hoisting or hauling gear.

The window treatment is interesting. Where openings occur, the concrete posts are shaped in the style of mullions and continue through the opening, thus eliminating load-bearing window lintels. Window frames are held in place by hook-bolts and steel bars that run through the posts.

Inside walls are of aluminum insulating sheet, fastened to the uprights and lined with glass fiber. Insulating board forms the finished interior wall.

The uprights of the upper story are connected to the corresponding posts below by projecting metal dowels. At floor level the posts are stiffened by metal straps, as shown in the photograph, and are also bolted to the first-floor joists and roof members. Joists are of light-gauge steel, with timber fillets for ceiling and floor attachment.

Sir Edwin Airey is the designer of the Airey house, of which 13,000 are already on order from the present production program of 20,000. The Cussins house was developed by the building firm of Cussins of Newcastle-on-Tyne.

British Information Service Photos

* "Kariscol" Steel Frame and Connections.

ANALYZING THE SMALL INCINERATOR

By Dwight F. Metzler*

*Formerly P. A. Sanitary Engineer (R) U. S. Public Health Service; Sanitary Engineer Consultant to Region III, Federal Public Housing Authority.

A STUDY of the design and effectiveness of small incinerators in low-rent housing projects was made recently by FPHA to assist in making recommendations for future projects. The investigation covered installations totaling 498 incinerators in 10 large housing developments in the midwest.

In practically all projects incinerators proved an efficient and economical means of reducing garbage, trash, and other refuse to a stable residue, thus eliminating problems of odor and vermin which often accompany the collection of garbage.

To perform adequately the incinerator must generate temperatures in excess of 1250° F. (usually 1300° to 1450°) in order to ignite carbon monoxide and the hydrocarbons that cause noxious odors. The flow of air is controlled by the design of dampers, grate, and flue, and care must be taken not to overload the grate. A design figure of 1 sq. ft. of grate for 30 to 50 lb. of refuse is commonly used. Refuse has been found to total about 3½ lb. per person per day.

Combustible household rubbish, such as paper and rags, serves as fuel if present in quantities of 35 to 50 per cent of the total weight. When less than 35 per cent of the refuse is rubbish, an auxiliary source of fuel is necessary.

In general, the incinerators studied were of the three types shown below. None has an auxiliary source of fuel.

The advantage of the flue-fed incinerator was found to be convenience for tenants in multi-story buildings, since disposal chutes can be located on all floors. In such incinerators, firing and burning of volatiles takes place in one chamber, and the firebox must therefore be larger than in other types to allow more complete combustion.

The flue-fed incinerator sometimes produces fly ash problems since much of the combustion takes place in the stack and excessive velocities may force unconsumed material through the spark arrestor. Combustion can be improved, however, by careful control of draft.

Some incinerators with stacks extending only above the two-story level lacked sufficient draft; three-story stacks operated without difficulty.

Incinerators that are not flue-fed can be provided with a separate combustion chamber to (1) mix the volatile gases with proper amount of air; (2) complete the combustion of escaping volatile matter, and (3) collect suspended solids such as ashes and charred paper.

This type operates best when designed with baffles or turns in the flue which cause fly ash and dust to settle out.

Particularly good results were noted in the housing project where incinerators were of the type shown in (3). There, the firebox is separated from the combustion chamber by a baffle; space for the firebox is .24 cu. ft. per person served; and the combustion chamber is a combination baffled compartment and horizontal flue, connected to the stack of the heating plant. This gave the most complete garbage reduction of all incinerators studied — approximately 90 per cent of all of the combustible material.

The following suggestions are made to assist in the design of incinerators for multiple dwellings:

1. Arch design should deflect as much heat as possible from the outer wall.

2. Specify the best quality of firebrick available. Its fusion point should be not less than 3000° F., and compression strength, 7500 lb. per sq. in. Brick of best quality affords full benefit from heat retention, which is essential for complete combustion of gaseous products.

3. Provide bull-nose brick around the incinerator door openings and the edge of the flue to prevent excessive spalling.

4. Most complete combustion results when the combustion chamber is separated from the firebox by a baffle.

5. Hopper doors should be somewhat wider than containers used, at least 10 in. deep, and 3 to 4 ft. at their top above the platform or floor.

6. Quantity of air admitted to the firebox should be sufficient to give a stack velocity of 15 to 20 ft. per sec. Too much air results in substantial heat loss, decreased combustion, and excessive velocities of stack gases.

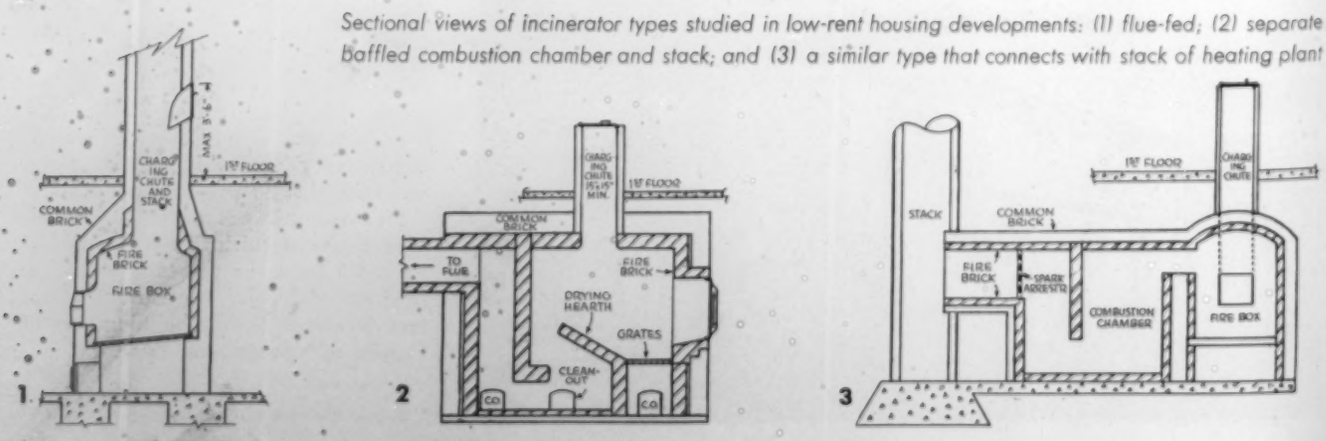
7. Grates are necessary for efficient operation, and should be raised far enough above the firebox floor to provide good air intake.

Dimensions for flue-fed incinerators.

No. Families Served	Flue Sizes[1]	Firebox Dimentions (Approx.)[2] Width	Depth	Height
6	16″ x 16″	1′–9″	1′–9″	4′–0″
10	20″ x 20″	2′–6″	2′–0″	4′–0″
15	20″ x 20″	2′–9″	2′–0″	4′–3″
20	20″ x 20″	3′–0″	2′–4″	4′–4″
30	20″ x 20″	4′–3″	2′–6″	4′–4″

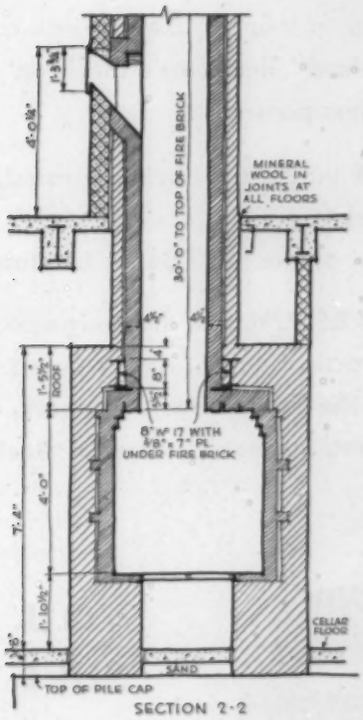
[1] For buildings over six stories this size should be increased to 24″ x 24″.
[2] Dimensions in the clear above the grate for units fired once a day.

Sectional views of incinerator types studied in low-rent housing developments: (1) flue-fed; (2) separate baffled combustion chamber and stack; and (3) a similar type that connects with stack of heating plant

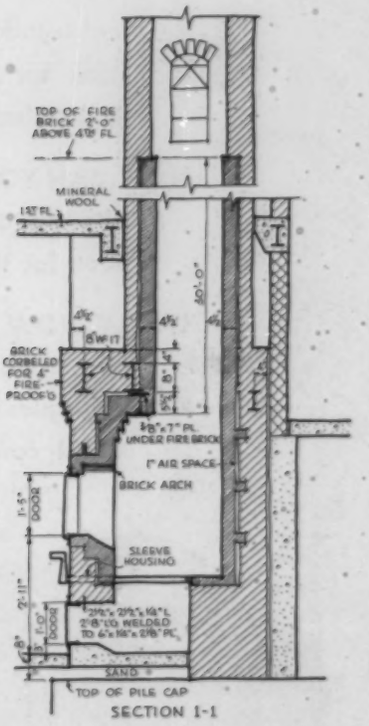


APARTMENT INCINERATORS

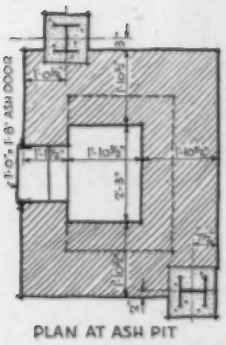
Designs from New York City Housing Authority for Abraham Lincoln Houses. Skidmore, Owings & Merrill, and Tandy & Forbes, Architects


MINERAL WOOL IN JOINTS AT ALL FLOORS
30'-0" TO TOP OF FIRE BRICK
8" I 17 WITH 5/8" x 7" PL. UNDER FIRE BRICK
CELLAR FLOOR
SAND
TOP OF PILE CAP

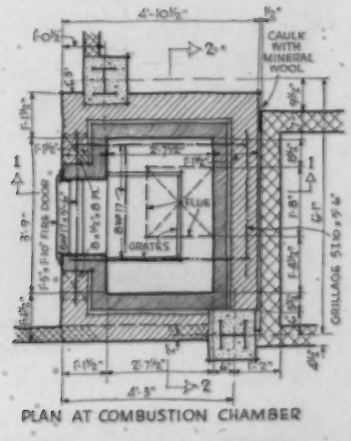
SECTION 2-2



SECTION 1-1



PLAN AT ASH PIT



PLAN AT COMBUSTION CHAMBER

INCINERATOR FOR 6-STORY BUILDING

(Continued on page 135)

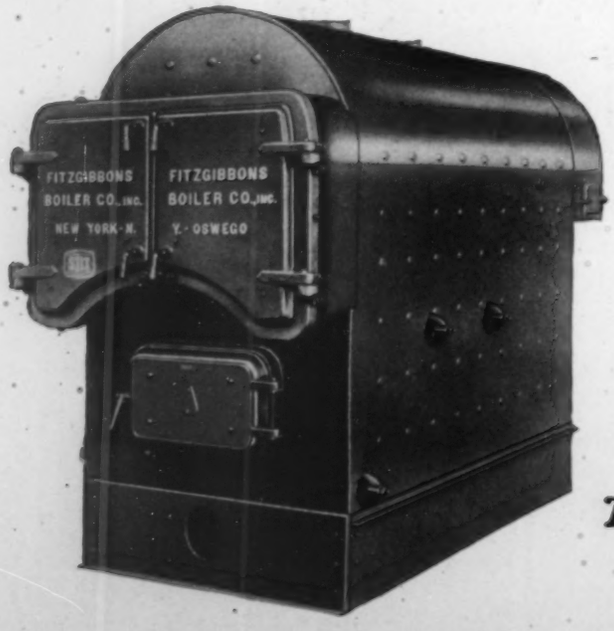
How to take the gamble out of boiler selection

HOW CAN YOU BE SURE you're getting a steel boiler whose construction is in rigid accordance with the standards set by the American Society of Mechanical Engineers?
Look for the A.S.M.E. stamp on the boiler.

HOW CAN YOU BE SURE your steel boiler has been inspected and hydrostatically tested to insure A.S.M.E. code conformance?
Look for the "Hartford" inspector's mark on the boiler—your guarantee that he has passed it.

HOW CAN YOU BE SURE the boiler is honestly rated, and will perform right up to or beyond its given capacity?
Look for the Symbol of the Steel Boiler Institute—on the boiler.

LASTLY, HOW CAN YOU BE SURE that the **design** of your boiler is free of untried and impractical quirks, and is based on sound, proven principles? **Look for the Fitzgibbons trademark, an emblem mark of 61 continuous and successful years of steel boiler building.**



YOU CAN BE SURE OF *THIS* BOILER

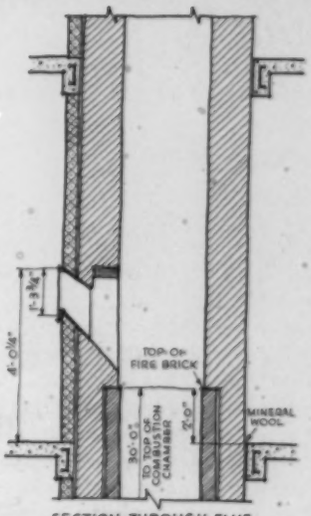
The Fitzgibbons "D" Type—suitable for heating anything from a moderate sized apartment to a large institutional building. On it you will find every one of the "sterling" marks shown above. Built in types for oil, gas, stoker and hand firing, in sizes up to 42,500 sq. ft. steam. "D" Type Catalog, recently published, on request.

Fitzgibbons Boiler Company, Inc.
101 PARK AVENUE, NEW YORK 17, N. Y.
Manufactured at: OSWEGO, N. Y.
Sales Branches in Principal Cities

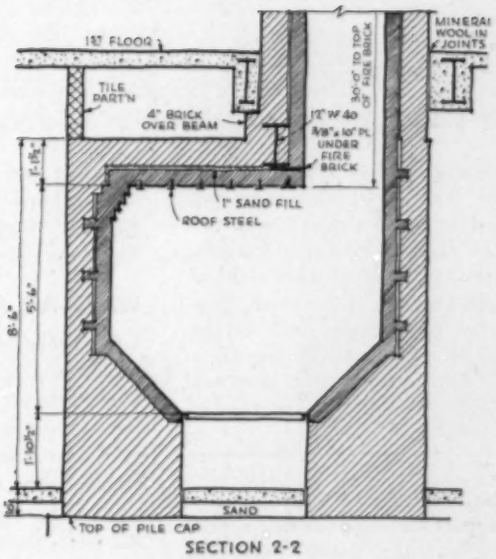
FITZGIBBONS

APARTMENT INCINERATORS

(*Continued from page 133*)



SECTION THROUGH FLUE



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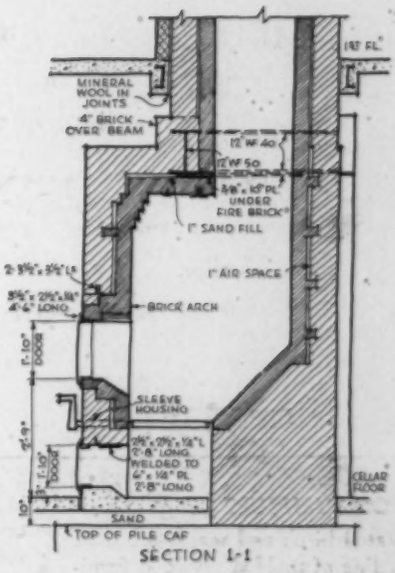

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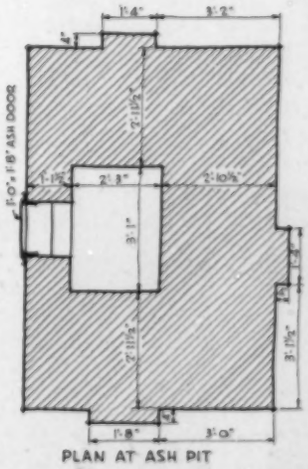
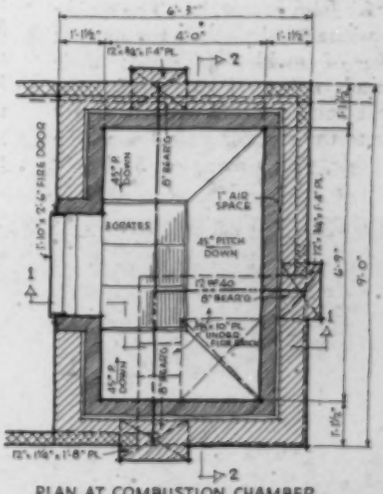


PLAN AT ASH PIT



PLAN AT COMBUSTION CHAMBER

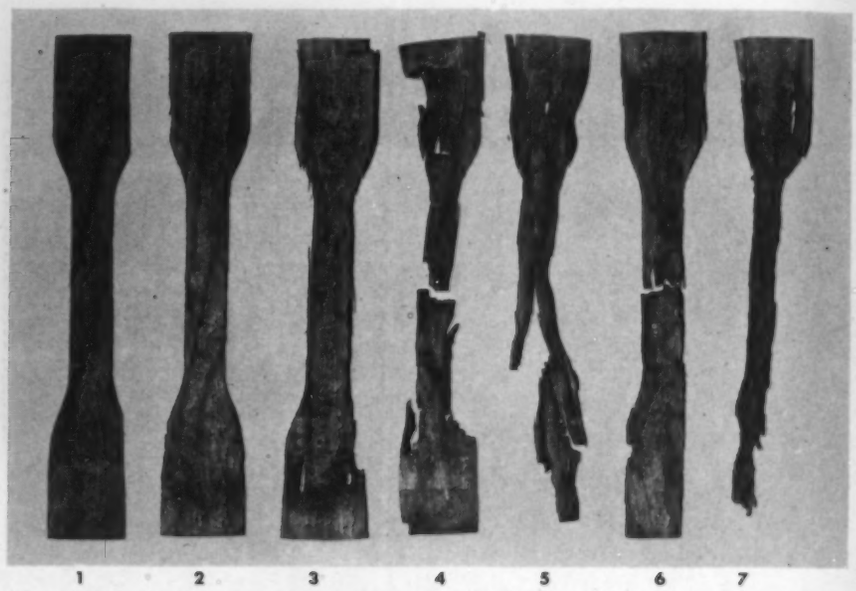
INCINERATOR FOR 14-STORY BUILDING

PRODUCTS
for Better Building

WOOD PRESERVATIVE

Interest in wood preservation is definitely not new but there have been interesting developments in the field of materials preservation, partly through wartime research that sought a means of combating mildew and rot in hot, wet climates. As a result of this experience, it is now claimed that decay can be prevented in wood by the application of a primer or sealer containing a fungicide such as *Nuodex* copper or zinc napthenate. A number of paint manufacturers are said to be manufacturing treating solutions containing these napthenates, which can be brushed, sprayed, or dipped on wood.

Fungi causing rot and mildew are not confined to the tropics but flourish wherever humidity, the chief contributing factor, goes over 80 per cent and temperature over 75° F. The following places in wood structures are suggested as needing special protection: all timbers in contact with stone or cement foundations, cement porch floors, and fireplace foundations; timbers in contact with cold-water pipes; interior timbers in attics not ventilated in summer and winter; wood paneling in basement rooms; sheathing and uprights beneath windows; ends of such structures as porch pillars, particularly lower ends; wood steps and porches; wood floors overlaid with linoleum; all timbers that come in contact with the ground; and ends of adjoining timbers.



Result of 30 days' soil burial of yellow birch veneers dipped in the following preservatives: (1) Nuocide Copper (2 per cent); (2) Nuocide Zinc (4 per cent); (3) Nuocide Zinc (2 per cent); (4) and (5) other preservatives; (6) Nuocide Mercury; and (7) untreated

The following advantages are claimed for napthenates: (1) permanent protection, since napthenates will not be leached out by moisture; (2) deposit is neither oily nor greasy; (3) surfaces can be painted; (4) there is no increase in fire risk; and (5) there is no irritating effect upon eyes or skin while being applied. Nuodex Products Co., Inc., Elizabeth, N. J.

WARM-AIR PANEL HEATING

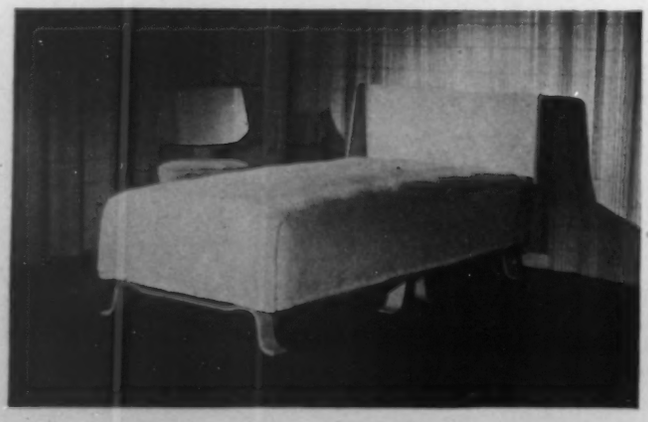
No registers, grilles or radiators are visible in a house equipped with *Panel-aire* warm-air heating. Air is heated in the conventional way by a *Luxaire* gas-fired forced-air furnace, and conveyed to stacks in the stud spaces, but there the resemblance to ordinary warm-air heating ends. Instead of introducing the air into the room, it is fed into a specially constructed space between the joists and ceiling, which radiates warmth downward into the room. Sheet rock insulating board is nailed to the bottom of the joists, and the ceiling (plaster on metal lath) hung several inches below. C. A. Olsen Mfg. Co., Elyria, Ohio.

(*Continued on page 158*)

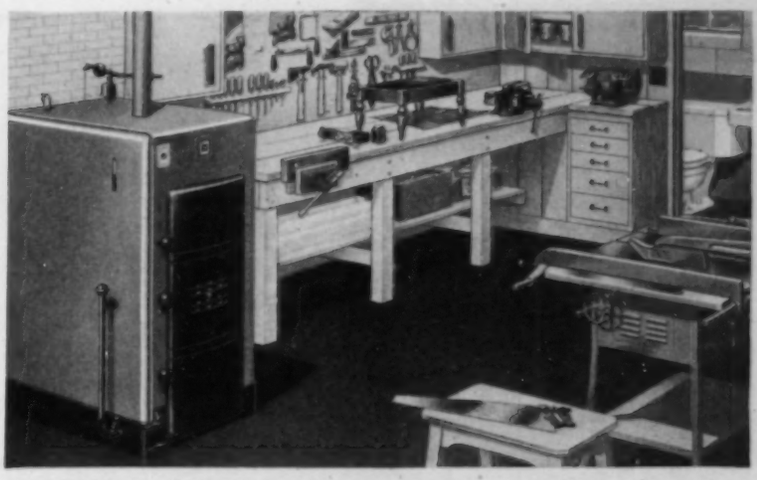
PLYWOOD FURNITURE

Laminated birch and maple are used in a new line of molded plywood furniture, designed by Allen and Edwin Kramer for John Stuart, Inc. The dining and occasional chairs utilize the natural resilience of molded plywood; their backs made adjustable by placing the underseat bolt to the front for a "soft" back, or to the rear for a rigid one. The dining table, which measures 32 by 48 in., can be extended to 60 in. A new type of support for couch or bed is provided by *Ply-Units*, molded plywood skids that replace the conventional leg and caster. Headboards are available to fit twin, double, and swing-type beds, and as a back rest for a studio couch. Finishes are blackwood, mahogany, natural, and colored lacquer. John Stuart, Inc., 4th Ave. and 32nd St., New York, N. Y.

Gotthelf-Field Photo



Expertly engineered and sturdily built for Dependability . . .



The **SEVERN** Boiler. For small or medium size homes. Burns coal (hand-fired or stoker), oil or gas with utmost efficiency and economy. Notable among its advantages are large fuel chamber and combustion space; scientifically designed flue passages; extra large 7-inch top nipples placed partially below water line; permanent iron-to-iron fit of all sections and flues; and small water content to insure rapid circulation and quick steaming.

Smartly styled in many types and sizes for Adaptability . . .

This group includes the **MASTER PEMBROKE**, a graceful bath of Neo-Classic design featuring a lower rim, large bathing space and a flatter bottom for greater comfort and safety; the **COMPANION**, a genuine vitreous china lavatory which can be had also without legs for wall support; the **MASTER ONE-PIECE**, a compact, genuine vitreous china water closet with a quieter, more efficient syphon-vortex water action. All three pieces are available in white and many attractive colors. Also shown is the **ARCO**, a slim-tube, space-saving radiator.

AMERICAN-Standard

HEATING PLUMBING

■ You'll find just the heating equipment and plumbing fixtures you need in American-Standard's extensive line. And you can be sure that whatever you select will be striking in design, efficient in performance, economical in operation, and durably constructed. For millions have been spent—in research . . . in engineering . . . in production facilities—to make American-Standard Heating Equipment and Plumbing Fixtures the finest that money can buy. Yet they cost no more than others . . . and are available for modernization on a convenient Time Payment Plan. For details, see your Heating and Plumbing Contractor. **American Radiator & Standard Sanitary Corporation**, P. O. Box 1226, Pittsburgh 30, Pennsylvania.

AMERICAN-Standard HEATING · PLUMBING

Serving the Nations' Health and Comfort

LOOK FOR THIS MARK OF MERIT—It identifies the world's largest line of Heating and Plumbing Products for every use . . . including Boilers, Warm Air Furnaces, Winter Air Conditioners, Water Heaters, for all fuels—Radiators, Convectors, Enclosures—Gas and Oil Burners—Heating Accessories—Bathtubs, Water Closets, Lavatories, Kitchen Sinks, Laundry Trays, Brass Trim—and specialized products for Hospitals, Hotels, Schools, Ships, and Railroads.

MANUFACTURERS' LITERATURE

AIR CONDITIONING

Dorex Activated Carbon Air Recovery Panels. Catalog of air recovery units, containing complete data on design, construction, function and application. Bulletin features a performance chart providing all data necessary for panel selection. Also includes table of recommended fresh air requirements for home, office, store, theater, school, hospital, etc. 18 pp., illus. W. B. Connor Engineering Corp., 114 E. 32nd St., New York 16.

ASBESTOS

Asbestos: The Silk of the Mineral Kingdom. By Oliver Bowles. What asbestos is, where it is found, its early history, characteristics, mining and milling methods, uses. Among uses discussed are roofings and sidings of asbestos-cement, pipe coverings, insulation. 40 pp., illus. The Ruberoid Co., 500 Fifth Ave., New York 18.*

CONTROLS

Control Equipment. Folder of catalogs of hydraulic action controls, light and heavy duty thermostats, fan and limit controls, oven controls, hot water and steam controls, damper motors, gas valves and safety pilots, refrigeration controls. Specifications and price list. White-Rodgers Electric Co., 1209 Cass Ave., St. Louis 6, Mo.

Motor Controls (Catalog 10). Catalog of manual and magnetic starters, accessories and enclosed switches. Dimensions tables, specifications, price lists. Wiring diagrams. Wire tables for 1947 Code. 124 pp., illus. The Arrow-Hart & Hegeman Electric Co., 103 Hawthorn St., Hartford 6, Conn.*

ESCALATORS

Otis Escalators. History of the Otis Escalator and non-technical information on location, maintenance, safety record. Cut-away section showing construction details; description of safety devices employed; explanation of operation; typical applications. 22 pp., illus. The Otis Elevator Co., 260 Eleventh Ave., New York, N. Y.*

FIRE PREVENTION

Fire Prevention. Brief catalog of Howie kalamein and metal clad doors, smoke screens, metal covered windows, frames and trim, entrance doors, etc. Includes sections of corridor partition, standard frames and trim, and dumb waiter door. Shows typical door designs. 4 pp., illus. John D. Busch and Sons, Inc., 639 E. Fort St., Detroit 26, Mich.

GUNITE

Gunite Buildings. Process of constructing stores, theaters and medium size buildings with solid reinforced Gunite. Describes the single wood form employed by the Gunite method. 4 pp., illus. Johnson Western Co., Dept. AR, Box 6, San Pedro, Calif.

INSULATION

Insulating Varnishes. Technical and application data on G-E insulating varnishes. Specifications, electrical properties, film properties, cure and aging, chemical resistance, baking cycles of each type. Types include black baking, black air drying, clear baking, clear air drying, sticking varnishes and air drying and baking enamels; 36 grades described. 40 pp., illus. General Electric Co., Chemical Dept., Pittsfield, Mass.*

INTERCOMMUNICATION

(1) Talk-A-Phone and **(2) Talk-A-Phone Special DeLuxe.** Catalog of the complete line of Talk-A-Phone models (1), with specifications and diagrams given for each system. Description of a new deluxe model (2) featuring compact streamlined cabinet and extra powerful amplifier. 12 and 2 pp., respectively, illus. Talk-A-Phone Co., 1512 S. Pulaski Rd., Chicago 23, Ill.

LIQUID RUBBER

Elaterite Liquid Mineral Rubber. Brochure describing a line of Elaterite products: plaster and stucco bond, waterproofing, mastic flooring, fibrated roofing and non-fibrated roofing, troweling cement, acid resistant and heat resistant paint, aluminum paint. General information on each, typical applications. Elaterite Non-Metallic Products Co., Dept. AR, Los Angeles, Calif.

LUMBER

(1) Grade Use Guide and **(2) Yard Grades.** Data sheets featuring the new lumber grades adopted by the California Redwood industry. List of the proper yard grades for more than 90 specific uses of Redwood in building construction (1), with tables on net sizes of standard patterns of worked Redwood lumber and surfaced Redwood yard lumber. Description of each of the seven new yard grades of Redwood (2), with the suitability of the grade for specific purposes indicated. California Redwood Assn., 405 Montgomery St., San Francisco 4.

Typical Lumber Designs (1947 edition). Over 200 typical lumber roof truss designs listed for garages, stores, churches, theaters, gymnasiums, warehouses and hangars. Other designs cover low cost prefabricated houses, grandstands, various types of towers, bridges and railway structures. Designs employ the Teco connector system of construction. Quantities and materials lists included. Timber Engineering Co., 1319 18th St., N.W., Washington 6, D.C.

PLUMBING

Fairfacts Vitreous China Bathroom Accessories (Catalog 41). Description of a complete line of accessories: soap and tumbler holders, glass shelves, wall grips, etc. Specifications, installation details. Also includes information on kitchen drainboard sections and sink trim. 16 pp., illus. The Fairfacts Co., Inc., 245 W. 14th St., New York, N. Y.*

STEEL DOORS

Mahon Rolling Steel Doors, Grilles and Shutters. Catalog of hand operated, mechanically and power operated doors and grilles. Complete specifications for each model. Models include standard push-up and between jambs push-up types, chain operated, chain-gear, multiple doors with intermediate post, crank and power operated doors. Dimension tables for each. 16 pp., illus. R. C. Mahon Co., Detroit 11, Mich.*

STRUCTURAL GLASS

Carrara: The Modern Structural Glass of Infinite Possibilities. Recommended uses of Carrara glass in public buildings, commercial buildings, laboratories and other industrial applications, and residential. Prefabricated units for the home, including bathtub wainscot and kitchen panels. Specifications and physical characteristics, installation information. 20 pp., illus. Dept. G-6554, Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh 22, Penn.*

SYNTHETIC RUBBER

Our Third Report to Industry on Simplex Synthetic Rubber Insulations. Discussion of the future of synthetic rubbers, the properties of some of the principal types of compounds used on insulated wire, tables comparing typical values of synthetic and natural rubber insulations. 12 pp. Simplex Wire & Cable Co., 79 Sidney St., Cambridge 39, Mass.

WASHROOMS

Scott Washroom Advisory Service. Typical layouts for small and large plant locker and washrooms, school washrooms, plant recreation rooms,

(*Continued on page 170*)

* *Other product information in Sweet's File, 1946.*

View from side street. A colorful bed of plants and flowers lines the show window. Behind it is a mass display of potted plants on wooden stands. Cobble-stones add to the informal "garden" atmosphere.

View from main street. Floor-to-ceiling glazing of the front makes a dominant display of the cut flowers in the refrigerator case. The wall supporting the case is faced with eye-catching aluminum Zourite.

How Store Front Ideas are made Practical and Profitable by the Modern K-47 Line

To construct store fronts which are striking in appearance and in sales-building power, leading contemporary designers analyze a store's merchandising needs as well as its structural demands.

By solving these two problems and by using materials which meet modern architectural standards, store fronts of distinction can be designed and built.

The K-47 Line of store front metals has been styled and engineered to answer today's new requirements. It offers these important advantages—

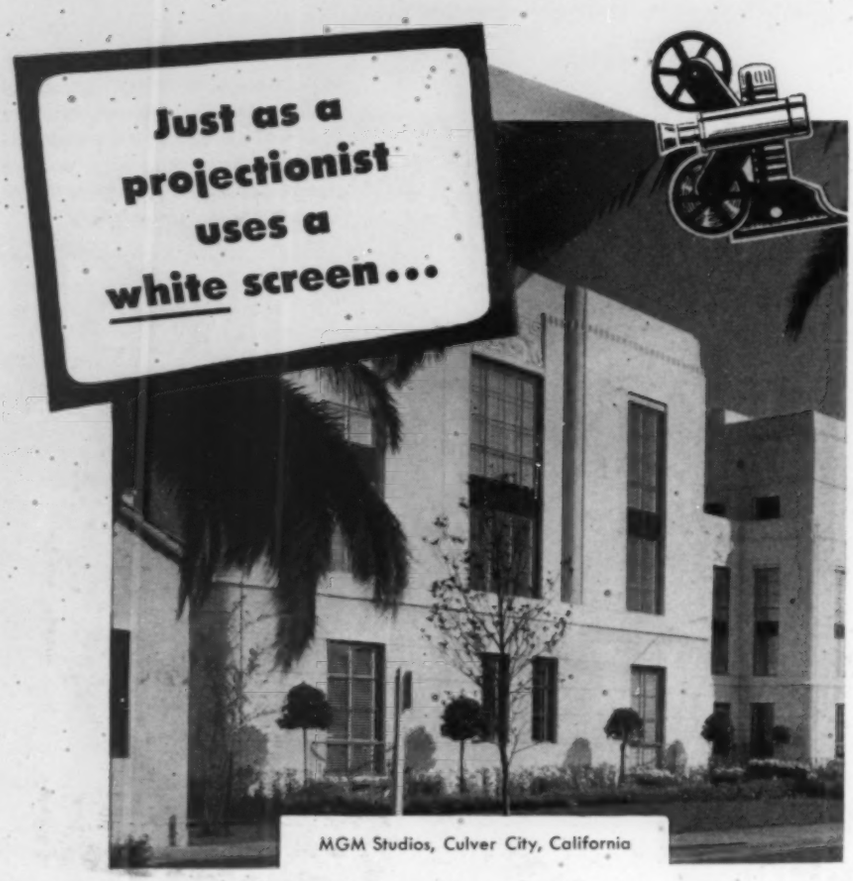
NEW custom-styling in stock shapes. The members which compose the K-47 Line possess the striking individuality which formerly could be obtained only in expensive, specially-detailed, made-to-order sections.

NEW interchangeable members with multiple uses. Face members can be interchanged to gain new effects, and they can be used for a variety of architectural purposes.

NEW features in construction. With the K-47 Line you can use flush-glazing, full-vision doors, floor-to-ceiling lights of glass and many other elements of modern design.

Send for the new booklet which describes and pictures the outstanding K-47 Line. The Kawneer Company, 740 North Front Street, Niles, Mich.

Kawneer
SALES-BUILDING
STORE-FRONTS



Concrete craftsmen choose White Cement

The brilliant overtones of a Technicolor movie are brought out best against the white background of a motion picture screen. A darker screen would dull the colors. So, too, a matrix of Atlas White Cement sets off better the color values of pigments and aggregates in Terrazzo, Stucco, Cement Paint and Architectural Concrete Slabs. Such a matrix—rather than a darker one—gives the selected colors, in contrast or blend, a uniform clarity—a life-like sparkle.

In addition, Atlas White, a true portland cement, provides protection against moisture and the wear of weather. Simple cleansing suffices. Maintenance costs are low.

For further information, write the Atlas White Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

AR-C-17

FOR BEAUTY AND UTILITY

ATLAS WHITE CEMENT

FOR TERRAZZO, PAINT, SLABS, STUCCO

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel*
Sunday Evenings—ABC Network

THE RECORD REPORTS

(*Continued from page 18*)

Brock of Los Angeles, treasurer. Mr. Brock also served as treasurer during 1946.

Regional vice presidents for the coming year are: Region I, John Olson, Worcester, Mass.; Region II, Gustav A. Mezger, Roslyn Heights, L. I., N. Y.; Region III, William B. Dixon, Pittsburgh, Pa.; Region IV, Mark C. Bane, Richmond, Va.; Region V, George S. Goodyear, Charlotte, N. C.; Region VI, Thomas Coogan, Miami, Fla.; Region VII, Joseph B. Haverstick, Dayton, O.; Region VIII, Arthur E. Fossier, Chicago, Ill.; Region IX, Sig G. Pearson, Minneapolis, Minn.; Region X, O. G. Powell, Des Moines, Ia.; Region XI, Bill Caruth, Dallas, Tex.; Region XII, Alan E. Brockbank, Salt Lake City; Region XIII, Charles T. Gore, Denver, Colo.; Region XIV, Frank R. McAbee, Seattle, Wash. and Region XV, Lawrence B. Gibbs, Los Angeles.

NEW GROUP MEETS TO MODERNIZE CODES

Early last month the newly formed Building Officials Foundation held its first meeting in New York, inaugurating a program of building code study and betterment which will include the provision of a uniform testing procedure for the evaluation of new construction materials and methods.

One of the principal functions of the Foundation will be to encourage the adoption of the Basic Building Code promulgated by the Building Officials of America, Inc., the parent organization of the new group. The Foundation also will assist communities in the administration of their building laws and regulations, and provide building officials with authoritative reports on the materials and methods tested.

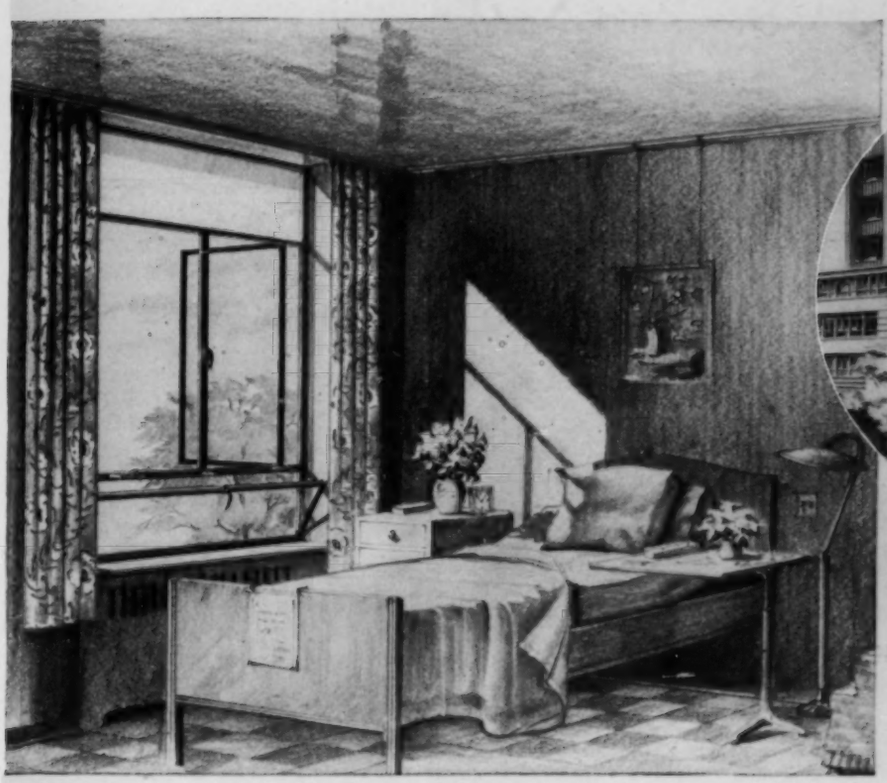
Chairman of the Foundation's board of governors and of the executive committee is Andrew J. Eken, head of Starrett Brothers & Eken. Serving with him on the executive committee are Joseph H. Carter, of Pittsburgh Steel Co., Bror Dahlberg, of The Celotex Corp., Bernard A. Savage, New York City building official, and Walker S. Lee of Rochester, N. Y.

Other industry members of the board are: H. L. Andrews, General Electric Co.; J. R. Fink, National Steel Co.; Thomas S. Holden, F. W. Dodge Corp.; Roy A. Hunt, Aluminum Co. of America; J. C. Ingersoll, Ingersoll Steel Co.; C. Louis Meyer, Ceco Steel Products Corp.; Leroy A. Petersen, Otis Elevator Co.; H. H. Robertson, H. H. Robertson Co.; George Shakel, Great Lakes Carbon Corp.; J. H. Thornley,

(*Continued on page 144*)

Designed for beauty... standardized for economy

NEW FENCRAFT FAMILY* OF WINDOWS



*Casement . . . Projected . . . Combination

Suggestion:

For hospital bedrooms, Fencraft Standard Intermediate Combination Windows, such as type 626 illustrated, provide abundant sunlight, and controlled fresh-air ventilation. Sill vent serves as built-in wind guard.

Three new lines of Fencraft Windows now offer new high quality, lower cost and important installation economy.

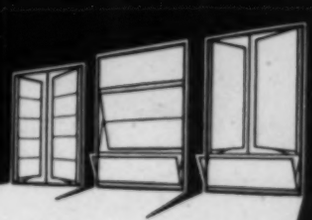
Built of specially-designed steel casement sections, by craftsmen in the shops of America's oldest and largest steel window manufacturer, all Fencraft Windows beautify both the outside and the inside. They provide permanently easy operation, firesafety, more daylight, better ventilation, safe cleaning, superior screening, lasting weather-tightness and low maintenance cost.

Singular economy in first cost is made possible by standardized manufacture—the concentration of production on standard types and sizes.

Uniform installation details, plus the coordination of window dimensions with those of collateral materials in the wall, minimize installation cost.

Eminently suited for America's finest buildings, Fencraft Windows are now being shipped to many localities. For product details, see Fenestra's catalog in Sweet's for 1947 (Section 16a-9). Or mail coupon below.

Fenestra



FENCRAFT INTERMEDIATE STEEL WINDOWS

Detroit Steel Products Company
Dept. 2252-AR-4
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Detroit 11, Michigan

Please send me data on types and sizes of the new Fencraft family of Fenestra Windows:

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doesn't mind the "rain"
that falls inside a wall
Moisture squeezed out of super-cooled air is always a problem in refrigerated structures. And that moisture (or melting ice and frost) plays havoc with ordinary materials.
Use Wolmanized Lumber there and decay can't get a start. It's standard structural lumber made highly resistant to decay by pressure-treatment with Wolman Salts* preservative.
YOU SAVE ON UPKEEP
This pressure-treated lumber costs little more than untreated wood. You save money by eliminating expensive replacements. There's no odor. And this treated wood can be painted.
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CREOSOTING
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*Registered trademarks
1679 McCORMICK BUILDING, CHICAGO 4, ILLINOIS

THE RECORD REPORTS

(*Continued from page 142*)

Western Foundation Co.; and Loring Washburn, S. H. Pomeroy Co.

Building officials, members of the board, in addition to Messrs. Savage and Lee, are: Albert H. Baum, St. Louis, Mo.; Arthur J. Benline, New York City; Fred C. Bergeson, Rock Island, Ill.; Charles A. Flanagan, Philadelphia, Penn.; R. S. Fredericks, Memphis, Tenn.; K. S. Gillies, Toronto, Canada; H. E. Hagood, Birmingham, Ala.; Bernard J. McKelvey, Bridgeport, Conn.; James H. Mooney, Boston, Mass.; John Picken, Montclair, N. J.; Arthur N. Rutherford, West Hartford, Conn.; George H. Slenker, Allentown, Penn.; and Lyle D. Webber, Denver, Colo.

MORE BUILDING IN '47

The volume of industrial engineering and construction will be higher in 1947 than in 1946 and may reach an all-time high as materials become more plentiful, prices become stabilized and government controls relaxed, predicts The H. K. Ferguson Co., industrial engineers and builders of Cleveland, New York and Houston. The opinion is the result of a survey of five executives in the company.

Special emphasis was put on industrial construction by several of the men questioned. A. Kingsley Ferguson, president of the company, commented that "basic industries in chemicals, steel, foods and textiles are now convinced that the increased demand for their products is sound and will last long enough to justify plant expansions even at higher costs."

C. W. Roberts, manager of the Company's southern district, emphasized the favorable prospects for industrial expansion in the South and Southwest. He pointed out that half of the total money invested in new chemical plants from 1935 to 1940 was invested in 12 southern states. Simplification of industrial plant design and a greater tendency toward standardization are prophesied as major 1947 trends by Wells N. Thompson, vice president in charge of the eastern district.

The cost of construction in 1947, the survey indicated, will probably be somewhat below the present peak, with decreases appearing mostly after midyear. Costs will not be radically lower, but will probably stabilize at some point near the average of the last two years.

MODULAR BUILDING

Important savings in the cost of building veterans' hospitals will result from the use of modular sizes of masonry products, windows and other building

(*Continued on page 146*)

IT'S BUILT FOR *Beauty*

Modern in design with beautiful chrome finish.

IT'S BUILT FOR *Duty*

All working parts are of heat-resistant non-corrosive bronze.

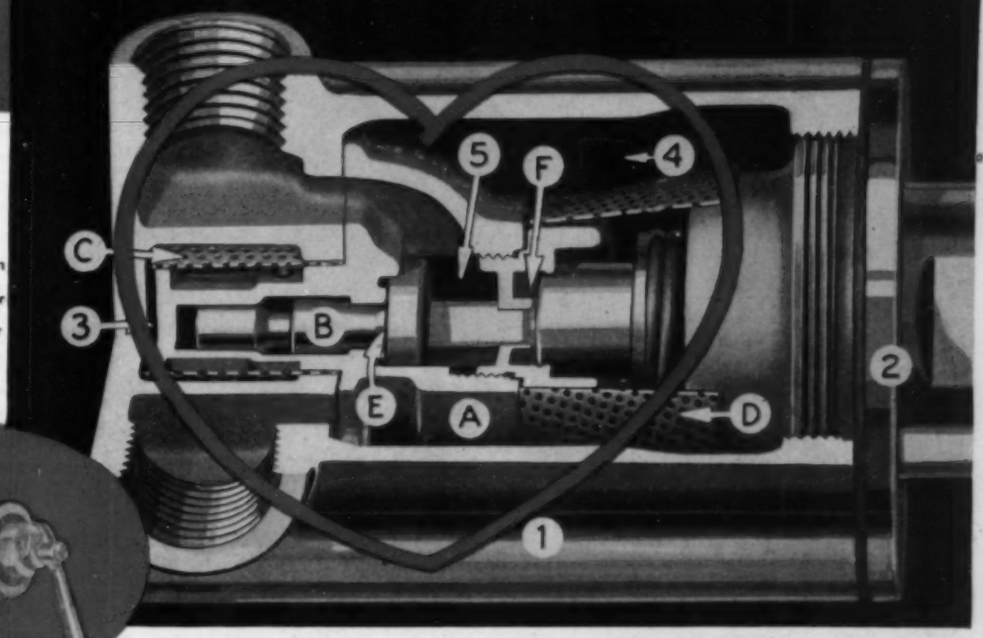
...AND IT'S "tops" IN *Shower Protection*

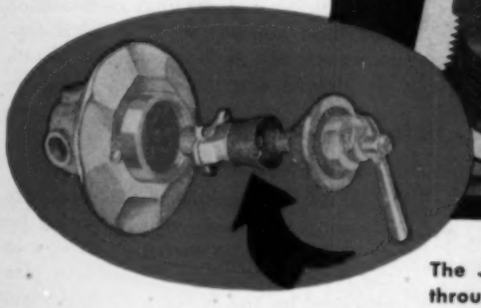
No accidental scalding; hot water shuts off when cold water fails.

Josam *scald-preventing* MODERATOR SHOWER MIXING VALVE

WITH *exclusive* HEART-OF-VALVE CONSTRUCTION

1. One-piece bronze body
2. Removable bronze bonnet
3. Cold water chamber
4. Hot water chamber
5. Mixing chamber "Heart-of-Valve" consisting of:
   - A. Cage carrying operating mechanism
   - B. Hydraulic-type shuttle valve
   - C. Bronze screen protecting cold water port
   - D. Bronze screen protecting hot water port
   - E. Neoprene cold water valve seat
   - F. Neoprene hot water valve seat





Maintenance is simple and easy. All working parts are combined in the "heart of valve" unit easily accessible by removing valve bonnet. Old unit can be removed and new unit installed in a jiffy. "Heart of valve" renewal units are available in individual packages.

The Josam Moderator Mixing Valve assures *lasting* shower bathing pleasure through simplicity of construction. A single moving part—the hydraulically operated shuttle valve—keeps hot and cold water "in balance" at the selected temperature and prevents accidental scalding. This shuttle valve is enclosed in the "heart of the valve"—a unit in which all working parts are combined. Even after years of wear or rough usage, there is no need of expensive replacement. All you do is replace the old "heart of valve" with a new one...and the valve is as good as new! The Josam Moderator Mixing Valve is ideal for residences, apartments, schools, colleges, hotels, clubs, institutions, factories, or wherever shower bathing is a regular routine. Fits readily into all standard shower installations. Send coupon below for complete details today!

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Building Directories
Bulletin Boards
Stamped and Cast Radiator Grilles
Grilles and Wickets
Kick and Push Plates
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Wrought Iron and Bronze Lighting Fixtures
Wire Work
Cast Thresholds
Extruded Thresholds
Extruded Casements and Store Front Sash
Bronze and Iron Store Fronts
Bronze Double Hung Windows
Bronze Casement Windows

THE MICHAELS ART BRONZE CO., Inc.
234 Scott St., Covington, Kentucky

THE RECORD REPORTS

(*Continued from page 144*)

materials, according to Tyler S. Rogers, president of the Producers' Council, commenting on the recent decision of the Army Engineer Corps to encourage the use of modular products in the $600 million hospital program.

"The veterans' hospital program will serve as the first large-scale demonstration of the cost-reducing possibilities of modular coordination," Mr. Rogers said, "inasmuch as construction of most of the buildings which have been designed on the modular basis has been delayed by the federal order limiting the volume of non-residential building."

Completion of the hospitals, Mr. Rogers pointed out, will be speeded up by the use of modular products, which can be put in place with much less cutting and fitting than is required for the traditional sizes.

The decision of the Army Engineer Corps, Mr. Rogers said, "also will serve to stimulate interest in designing other buildings on the modular basis and thus speed up the general adoption of coordinated dimensions. . . . Owing to the rapid adoption of modular coordination during the last few years, the entire outer shell of any building now can be constructed with products whose dimensions have been coordinated under the modular program."

The Producers' Council is conducting a series of regional meetings at which the principles of modular coordination and their application to hospital construction will be explained in detail, Mr. Rogers announced.

MUSEUM EXHIBITS

A Better Newark

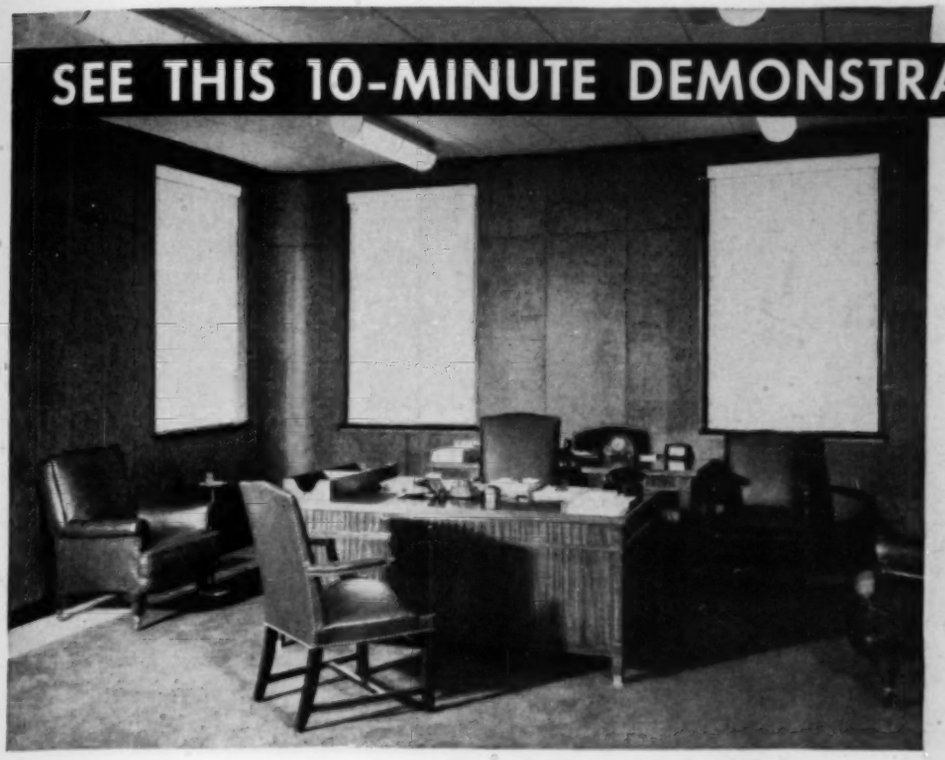
An exhibition showing what the City Planning Commission is proposing for Newark, N. J., is currently on view at the Newark Museum. The master plan prepared by the Newark Central Planning Board's engineers, Harland, Bartholomew and Associates, forms the basis for the exhibition, which includes models, plans, photographs, maps and charts.

Highlighted in the presentation are drawings of the proposed War Memorial Plaza, the convention hall and sports arena, and the cultural center of which the Museum will form a part. Charts show the major street plan and plans for parking and transportation facilities, housing developments, schools and recreation areas.

"Cleveland Builds"

An unusual exhibition at the Cleveland, Ohio, Museum of Art through April 9th is "Cleveland Builds — Work

(*Continued on page 148*)



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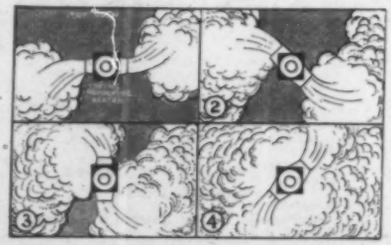
Not just another unit heater, the WING REVOLVING HEATER is unique in that it does what no other heater can do—its slowly revolving outlets gently distribute the heat continuously in a constantly changing direction. It reaches over, around and under obstructions into out-of-the-way corners, its moving streams of heated air quickly warm up a plant in the morning.

ADVANTAGES OF WING REVOLVING UNIT HEATERS

1. Makes workers feel comfortable, live and invigorated—more productive.
2. Reaches over and around obstructions and into out-of-the-way corners.
3. Moving discharge heats up plant quickly on cold mornings.
4. Reduces absenteeism due to colds resulting from drafts, chills or overheating.
5. Is an excellent cooling system in summer with steam off and fans on.

Revolving Discharge Outlets for Thorough Heat Coverage



1. Heater starts. 2. 15 seconds later, 45° revolution. 3. 30 seconds later, 90°. 4. 45 seconds later, 135° revolution.

Wing Revolving Unit Heaters keep the heated air moving, circulating around obstacles, seeking out far corners, spreading an even, uniform, healthfully invigorating blanket of warm air over the entire working area.

Its properly warmed, healthful air currents thoroughly distributed, create a sensation of live, invigorating comfort for the workers. Wing Revolving Unit Heaters are used in many of the country's leading industrial plants. Write for a list of installations.

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Factories at Newark, N. J. and Montreal, Canada

Wing REVOLVING UNIT HEATERS

THE RECORD REPORTS

(*Continued from page 146*)

by Cleveland Architects," showing postwar development in progress and projected in the Cleveland area, and a few of the projects which Cleveland architects are undertaking in other cities.

The Cleveland chapter, A.I.A., is sponsoring the show. There are 63 exhibits in all, including plans, drawings, renderings, perspectives and models by 34 Cleveland architects. The projects are commercial, residential, industrial, recreational, health, religious, educational and safety.

ON THE CALENDAR

April 19–26: Metropolitan Home Show, sponsored by Home Builders Council of New York, New Jersey and Connecticut; Grand Central Palace, New York City.

May 6–8: The President's Conference on Fire Prevention, Federal Works Bldg., Washington 25, D. C.

May 6–10: 2nd National Plastics Exposition and Annual Convention, The Society of the Plastics Industry, Coliseum, Chicago.

June 2–4: Semi-annual Meeting, American Society of Heating and Ventilating Engineers, Hotel del Coronado, Coronado, Calif.

June 12–22: 2nd annual Construction Industries Exposition and Home Show, Pan-Pacific Auditorium, Los Angeles.

June 16–19: Semi-annual Meeting, American Society of Mechanical Engineers, Stevens Hotel, Chicago.

July 7–13: 1st Annual Store Modernization Show, Grand Central Palace, New York City.

Sept. 1–4: Fall Meeting, American Society of Mechanical Engineers, Hotel Utah, Salt Lake City, Utah.

Nov. 3–7: 2nd International Lighting Exposition and Conference, Stevens Hotel, Chicago.

Dec. 2–5: Annual Meeting, American Society of Mechanical Engineers, New York or Atlantic City.

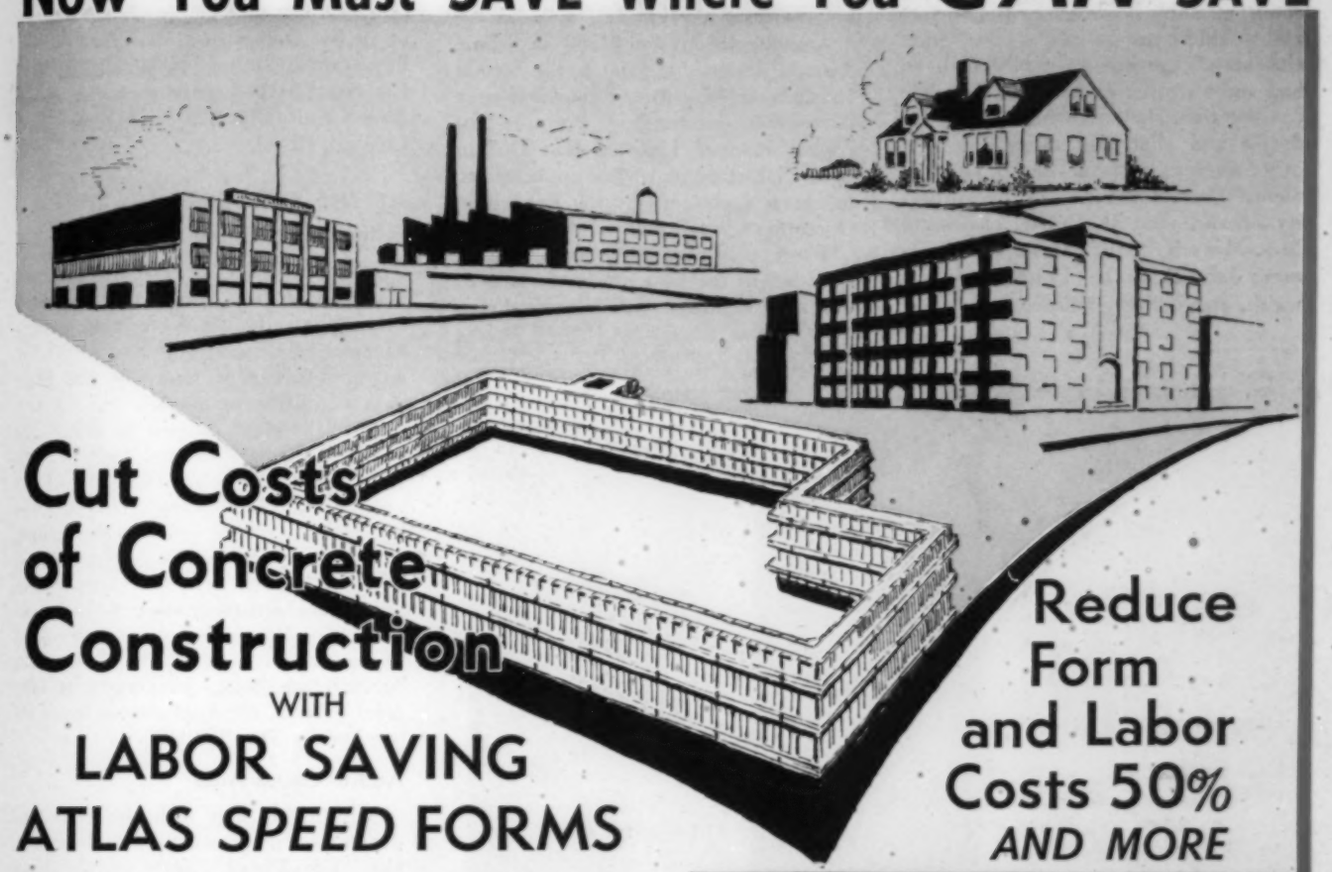
NEW HOUSING AGENCY?

In a surprise move early in March Mayor O'Dwyer of New York City acted to terminate the city's five-member, non-salaried housing Authority and replace it with a three-member agency responsible directly to the Mayor.

If the bill incorporating the proposal is passed by the State Legislature, the terms of the present members of the Housing Authority will expire on July 1st, at which time the Mayor will be empowered to reconstitute the agency as a three-member unit with a salaried, full-time chairman. The other two members of the board would be unpaid. The

(*Continued on page 150*)

Now You Must SAVE Where You *CAN* SAVE



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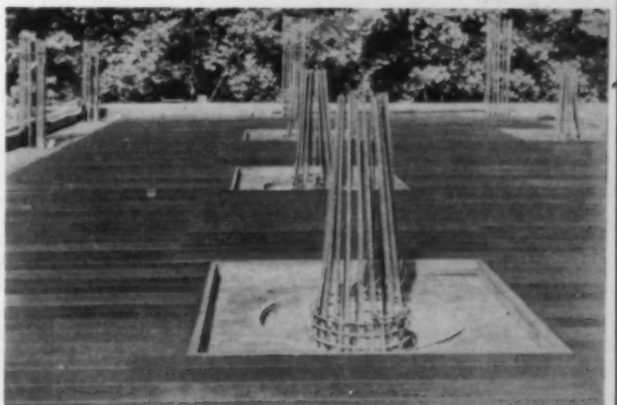


Interchangeable for walls or flat slab—National Distillers Co. Building, Frankfort, Ky.

This Modern Speed Method is the Answer to Today's High Labor Costs

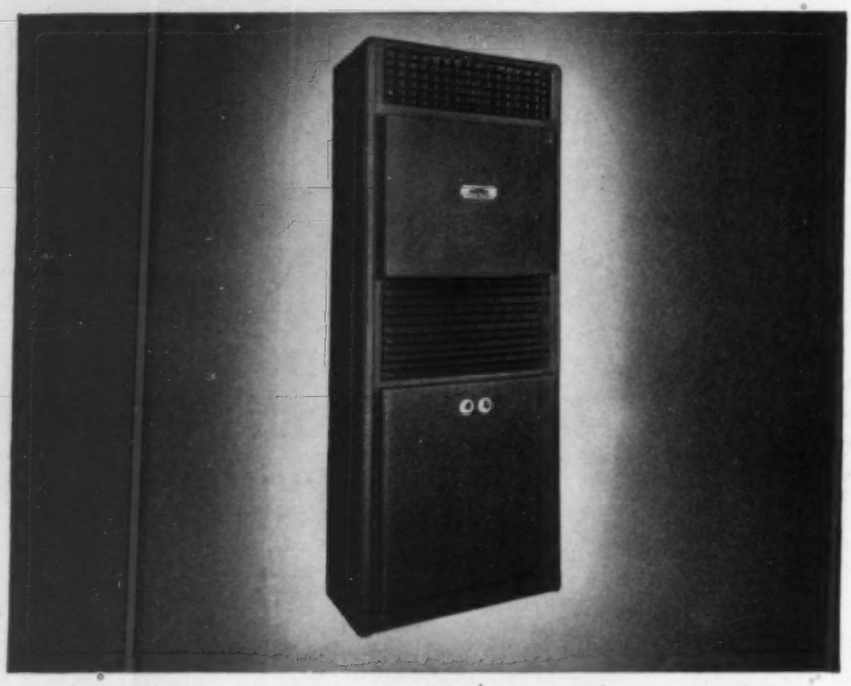
ATLAS LABOR-SAVING *SPEED* FORMS

chairman would be chosen by the Mayor, and would be responsible to him. "Such chairman," the bill states, "shall have had successful experience in large-scale construction, shall give full time to his duties and shall not engage in any other occupation, profession or employment." Present members of the Authority are Edmond B. Butler, chairman; Mrs. Mary K. Simkhovitch, vice-chairman; John S. Parke, Frank R. Crosswaith, and William Wilson.

LIGHTING CONTEST

A competition for $1200 in Merit Awards, designed to bring to the Second International Lighting Exposition next November outstanding examples of "What Planned Lighting Can Do" in industrial, store and office applications, has been announced by the Exposition Operating Committee.

Three prizes of $100 each will be awarded to the best entries from each of four classifications: (1) electrical contractors; (2) utility lighting representatives; (3) architects and consulting engineers; and (4) wholesaler's lighting specialists and salesmen. All entries must be in by August 31st. For further information and entry blanks, address the International Lighting Exposition Award, Suite 818, 326 W. Madison St., Chicago, Ill.



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AT THE COLLEGES

Fellowship Offered

The University of Illinois has announced the 16th annual consideration of candidates for the Kate Neal Kinley Memorial Fellowship offering $1000 for a year's advanced study of the Fine Arts in America or abroad.

The fellowship is open to graduates of the College of Fine and Applied Arts of the University of Illinois and of similar institutions whose major studies have been in music, art, or architecture. Applicants should not exceed 24 years of age on June 1, 1947. Application blanks and instructions may be obtained from Dean Rexford Newcomb, College of Fine and Applied Arts, Room 110, Architecture Bldg., University of Illinois, Urbana, Ill. Applications must be received by May 1, 1947.

Audio-Visual Aids

Keeping in step with the increased demand for progressive aids to teaching, the Audio-Visual Center of the City College School of Business, Evening and Extension Division, is expanding its auditory and visual aids services.

Dr. Louis S. Goodman, supervisor of the Center, reports that a program of close cooperation with schools, business and industry for the use of audio-visual aids is planned. The Center's services include a growing library of sound films, film strips and recordings, with complete facilities for presentation. Courses are given at the College in techniques of utilizing these new media. New instructional aids are being developed, with present emphasis placed on recordings and graphic materials.

A catalog of the material distributed may be obtained by writing to the Audio-Visual Center, City College of Business, 17 Lexington Ave., New York.

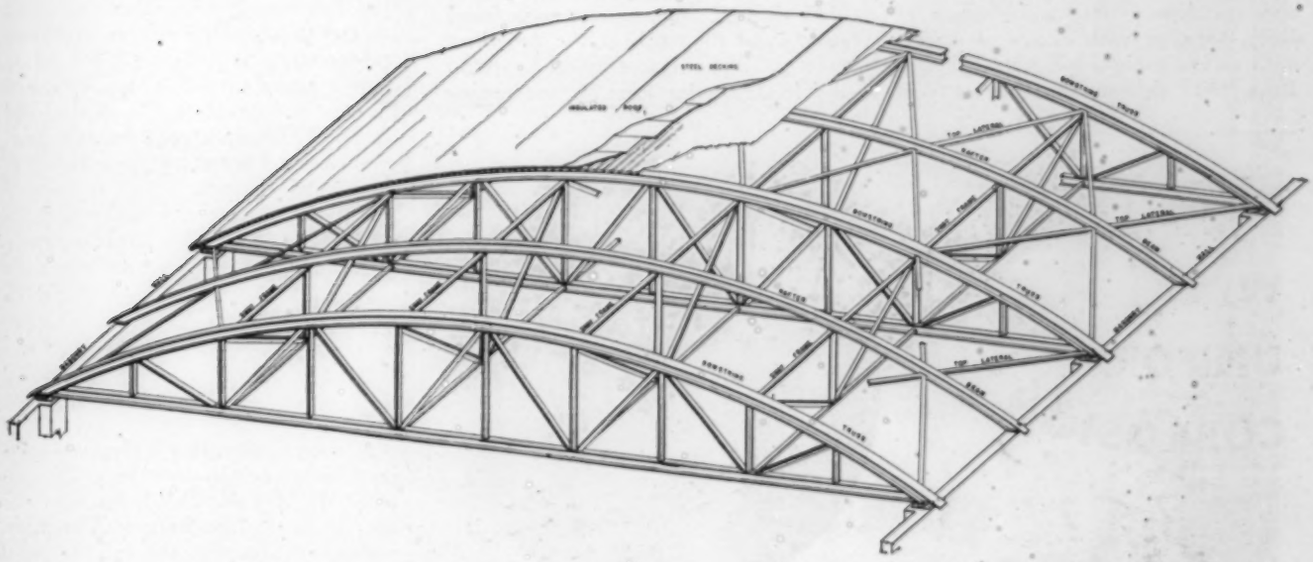
Masonry Research

Improved masonry construction and lower production costs are expected to result from six research projects at leading universities and technical institutions, reports Roy A. Shipley, president of the Structural Clay Products Institute. "The projects are being financed with grants totaling $103,000 from the Office of Technical Services of the U.S. Department of Commerce and will be supervised by the Institute," Mr. Shipley explains.

(*Continued on page 152*)

Welded Bow String Roof Truss is Economical and Efficient

By Ned L. Ashton
Consulting Engineer, Iowa City, Iowa



THE arc welded bow string roof truss shown above is intended for a 72-foot clear span roof supported on masonry walls, used in combination with an insulated steel deck. This type roof is ideal for large store buildings, hangars, garages, small factories, display rooms, etc.

The bow string truss is economical—uses only 4.4 lbs. of steel per square foot of area for the truss shown—and provides wide entrance-exit openings at ends of the building.

The truss consists of curved 6″-wide flanged top chord sections, 6″ light beam section bottom chords and 3″ x 4″ T section web members joined by electric arc welding. Trusses are spaced at 18′-0″ centers and span 72′-0″. Curvature radius of the top chord is 72′, same as span length. Trusses are 9′-7¾″ deep, center to center of chords, at the middle.

MINIMIZES STRESSES

Truss weight is estimated at 3200 lbs. per truss or 45 lbs. per foot of one truss. The dead load from roofing materials is slightly less than 12 lbs. per square foot. An analysis of the dead load web stresses reveals that they are very small. In fact, the truss is designed so that, under the dead load or a uniform snow load covering the whole span, there is no beam action of the top chord, the stress in every diagonal is zero and the stress is constant throughout the bottom chord. Under half live load conditions, the stresses in the web members alternate between tension and compression going from one member to the next along the truss. Both the chord and web stresses are reversible under varying wind conditions—the same member acting either in tension or compression depending on which way the wind is blowing.

RAFTERS AUGMENT TRUSSES

In addition to the bow string trusses, the roof decking gets support from light intermediate-curved 6″ joist section rafter beams. These make the truss spacing independent of the purlin span. In longer spans, 2, 3 or more of these intermediate rafters should be used between trusses for economy.

Rafters are 5-span continuous beams supported at intervals of 14′-4¾″ by the longitudinal sway frame trusses, and supported transversely by the top lateral bracing. In turn, the rafters cut down the unsupported length of the laterals.

REQUIRES LITTLE FIELD WELDING

Both the 72-foot trusses and the sway frames are designed to be completely fabricated in the shop. Field erection welding is confined to joining the sway frames, rafter beams, top laterals and roof decking.

A detailed study of this roof and the bow string type truss is made in a new series of Plates of "Studies in Structural Arc Welding," published by Lincoln Electric. To be placed on the mailing list for these and future Studies, write The Lincoln Electric Company, Dept. 262, Cleveland 1, Ohio.

Advertisement

At the University of Texas a study will be made to determine suitable specifications for materials and methods to be used in constructing tile-reinforced, precast floor beams. The effect of brick texture on the bond between mortar and brick will be studied at Virginia Polytechnic Institute, and factors affecting size variation in the manufacture of brick, together with causes of defects such as lamination, will be studied at Iowa State College, the University of Illinois, New York State College of Ceramics, and the National Bureau of Standards.

Analysis of Benton

Professor D. W. Laging, of the Department of Literature and Fine Arts, Michigan State College, East Lansing, Mich., is preparing a catalog and critical analysis of the work of the American painter, Thomas Hart Benton. He would appreciate hearing from anyone owning sketches, drawings or paintings (exclusive of lithographs) by Mr. Benton.

PIPE WITH UNIFORM CORROSION RESISTANCE from I. D. to O. D.

The corrosion-resistance of Duriron drain pipe is as thick as the wall. The acid-carrying ability of this pipe does not depend on a lining which can wear, chip, crack or spall.

Duriron pipe is made entirely of Duriron, a high silicon iron alloy with extreme resistance to practically all corrosives. For instance, 10% sulfuric acid, one of the worst *will not eat away more than 1/16" of the 5/16" wall of a 2" Duriron pipe in 900 years.*

For complete information on this corrosion-defeating, abrasion-resisting pipe, write for bulletin 702-D.

DURCO Adv. 29-GM

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Laboratories
Kitchens
Photographic Studios
Zink Engraving Plants
Battery Stations
Soda Fountains
Cinder Fills

THE DURIRON CO., INC.
DAYTON 1, OHIO

DURIRON ACID PROOF DRAIN PIPE

NEW PRODUCTS CENTER

Following its incorporation as a nonprofit undertaking, a Chicago Building Products Center is being organized under the joint sponsorship of the Chicago chapters of the Producers' Council and the American Institute of Architects. Directors named include Paul Gerhardt, Jr., and Charles D. Faulkner, president and secretary respectively of the A.I.A. chapter; and Robert R. Clegg, American Lumber and Treating Co. official, and George W. Bornquist, of Bornquist, Inc., president and secretary respectively of the Council chapter.

Negotiations are now under way for approximately 20,000 sq. ft. of floor space in a Loop office building to house the new Center. Approximately 16,000 ft. will be used for permanent exhibit space by building product manufacturers and the remainder will provide a meeting place and offices for the two sponsoring organizations and the administrative staff of the Center. Heads of several leading Chicago architectural firms are contributing by doing the design work for the project; manufacturers, in turn, will provide financing through the rental of exhibit space.

The Center is expected to be in operation by mid-summer, and will be open without charge to architects, builders, contractors and the general public. In the opinion of its founders it will perform a necessary public relations function for the industry by showing actual products that are now or soon will be available, thus helping to debunk the misinformation which the prospective home owner has been fed about the "home of tomorrow" and "pushbutton living." Forums on various phases of home planning and construction, special exhibits and demonstrations and similar events are planned, and architectural exhibitions of designs of specialized types of buildings — industrial, educational, residential, etc. — will be held from time to time.

APARTMENTS FOR PARALYZED VETERANS

Specially designed apartments for paralyzed veterans are being constructed by the State of New York at two emergency housing projects, Marine Park and Maritime Base, in Brooklyn.

The units are being built to fit the special needs of paraplegics, paralyzed from the waist down. Four three-room apartments, to accommodate 12 unmarried veterans, have been completed at Maritime Base and two three-room apartments for married veterans are under construction at Marine Park.

(*Continued on page 154*)

Multi-colored porcelain enamel mural, size 72 feet by 28 feet, given to the Union Terminal, Cleveland, Ohio, by the Ferro Enamel Corp., Cleveland. Designed and executed by J. Scott Williams in Seaporcel's plant.

Specify Seaporcel

Architectural Porcelain Enamel Parts

BECAUSE with Seaporcel the architect or designer is not restricted to conventional, cut and dried designs caused by limitations of materials *lacking* the flexible characteristics of Seaporcel porcelain enamel.

JUST AS THERE is attainable a free play in color and finishes, with Seaporcel porcelain enamel the architect can obtain fabrications in any shape, form or section; — rounds, compound curves, flutings, reedings, etc., etc.

AND, THANKS TO the everlasting fusion of porcelain and steel, Seaporcel* is fire-proof, corrosion and acid resistant, will not crack or craze when exposed to thermal shock and will withstand moderate mishandling.

SEAPORCEL is equally adaptable to broad and dramatic sweep for building facades, store fronts, interiors of public buildings, restaurants, banks, schools, hospitals, hotels. Make your final word on your next preliminary sketches: SEAPORCEL!

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*Seaporcel (Reg. U. S. Pat. Off.) is a ceramic coating fused into its metal base at 1550° F.

On the Pacific Coast:

Walter D. Bates Associates
693 Mission Street
San Francisco, Calif.

Douglas McFarland & Co.
1491 Canal Street
Long Beach, Calif.

Maritime Pacific Supply Co., Inc.
Alaska Trade Bldg.
Seattle 1, Washington

 (*Continued from page 152*)

The apartments are so designed that the veteran in a wheel chair can handle most of the normal operations of living with a minimum of difficulty. Extra wide doors and ramps will give easy access to and from adjacent parking areas. All doors open in and out, and there are no differences in floor levels to impede passage into or within the apartments. Bathrooms are larger than average to provide easy access to all fixtures from a wheel chair, certain fixtures are lowered, a permanent seat has been built into each shower, and special shower fittings have been provided. Lorimer Rich and Robbins Conn are architects for the Marine Park project, and J. M. Berlinger is the architect at Maritime Base.

ELECTIONS, APPOINTMENTS

Serge Chermayeff, A.I.A., F.R.I.B.A., has been appointed president and director of the Institute of Design, Chicago, succeeding the late L. Moholy-Nagy. Mr. Chermayeff has been professor of architecture and chairman of the Department of Design at Brooklyn College since 1942.

Dr. Leo L. Beranek, formerly director of the Electro-Acoustic and the Systems Research Laboratories of Harvard University, has been appointed associate professor of communications engineering in the Department of Electrical Engineering of the Massachusetts Institute of Technology.

Six new directors have been elected to the board of the American Standards Association: R. L. Pearson, vice president of the New York, New Haven and Hartford Railroad Co., to represent the Association of American Railroads; Curtis W. Pierce, president, National Fire Protection Assn. and president, Factory Insurance Assn., to represent the fire protection group; J. H. Hunt, director of the new Devices Section of General Motors Corp., to represent the Society of Automotive Engineers; J. H. McElhinney, vice president, Wheeling Steel Corp., representing the American Iron and Steel Institute; R. Oakley Kennedy, recently retired vice president of Cluett, Peabody, to become one of three directors representing general consumer interests on the board; and Auguste G. Pratt, president, The Babcock & Wilcox Co.

Ford, Bacon & Davis, Inc., engineers, have announced the election of Everett S. Coldwell as executive vice president and David A. Uebelacker as vice president and director in charge of new business activities.

The Grand Rapids chapter, A.I.A., has announced the election of the following officers for 1947: *president*, Phillip Cowles Haughey, Battle Creek; *vice president*, Carl C. Kressbach, Jackson; *secretary-treasurer*, Bernard J. DeVries, Muskegon; *chapter director*, Clarence H. Rosa, Lansing; *director to M.S.A.*, Paul E. Flagan, Grand Rapids.

The Turner Construction Co. has announced the following appointments: *vice president*, Nelson L. Doe; *general superintendent* in the New York office, Walter P. Jackson; *director*, C. F. Rosenburgh; *vice president*, and chief engineer of the Turner-Rostick Corp., Godfrey Lutz; *chairman of the board*, Robert C. Wilson; *president*, H. C. Turner, Jr.

OFFICE NOTES

Offices Opened, Reopened

Saul Edelbaum, A.I.A., has opened a new office for the practice of architecture, planning and design at 624 Madison Ave., New York 22, N. Y.

John W. Floore, Architect, until recently with the Army Air Forces, has opened an office for general practice at

(*Continued on page 156*)

BLIZZARD OVER CHOMO-LUNGMA

Few have braved the finial precipice of Everest; none has returned to tell what he found at the crest. It may be that man will never conquer its awful cold, the fury of the sudden hurricanes which lash, without warning, the highest spot on earth.

Few indeed fancy the risk of this unpredictable weather. But many have use for the controlled climate of refrigeration . . . the calculated cold of refrigerated spaces which is efficiently, economically safeguarded by Jamison Cold Storage Doors. Jamison-built doors go back almost as far as the cold storage industry itself. Half a century of know-how explains the confidence that refrigeration, cold storage, and frozen food operators have in the Jamison name.

For cold storage doors expressly tailored to your needs, choose from the Jamison standard line . . . Jamison, Stevenson, Victor, and NoEqual Doors. Your installation deserves this long-term investment in quality. Full information . . . and address of nearest Jamison branch . . . may be obtained by writing Jamison Cold Storage Door Company, Hagerstown, Maryland.

JAMISON
COLD STORAGE DOORS

Branches in Principal Cities, Coast to Coast

There is no substitute for

TRUE CHURCH TONE

as provided by Wurlitzer's rich family of voices

SPECIFICATIONS of the Series 20

Great Organ

	PITCH
Bourdon	16′
Viola	16′
Open Diapason	8′
Flute	8′
Flauto Dolce	8′
Viola	8′
Dulciana	8′
Celeste	8′
Octave	4′
Flute	4′
Violina	4′
Twelfth	2⅔′
Fifteenth	2′
String Mixture 2 ranks	
Chimes (Stop Tablet and Stop Tablet Switch only)	

Swell Organ

	PITCH
Bourdon	16′
Stopped Flute	8′
Flauto Dolce	8′
Viola	8′
Dulciana	8′
Voix Celeste	8′
Stopped Flute	4′
Violina	4′
Flute Twelfth	2⅔′
Flautina	2′
Oboe	8′
Tremulant	

Pedal Organ

	PITCH
Major Bass	16′
Dolce Gedeckt	16′
Octave Bass	8′
Diapason	8′
Violoncello	8′
Flute	4′

IN considering an electronic organ for church and chapel use, it is not enough that the instrument selected be small in size and cost. Above all else, it should provide the variety and qualities of tone which have for centuries been associated with the worship service.

The individual voices of the Wurlitzer Organ are so faithful to organ traditions that only the pipe organ can equal it in this respect. The Wurlitzer Organ tone is not a substitute for church music…it *is* church music, so perfect that it is inseparably associated with the devotional service. Even the names engraved on the stop tablets are completely familiar to anyone who knows the pipe organ.

If yours is a problem requiring this traditional church music, write for more details to Dept. AR-4, Organ Division, The Rudolph Wurlitzer Co., N. Tonawanda, N. Y.

The WURLITZER ORGAN *Series 20 Two-Manual*

THE RECORD REPORTS (*Continued from page 154*)

815 American Fidelity Bldg., Fort Worth, Texas.

Andrew R. Fritz, Architect, has opened his new office at Room No. 1, 189 Sunrise Highway, Rockville Centre, N. Y.

M. M. Konarski, Architect, and F. W. Stafford, Engineer, have announced the opening of their new office at Highland Sq., 844 W. Market St., Akron 3, Ohio.

Ellis L. Lavine, P. E., has opened a consulting engineering office at 132 Nassau St., New York 7, N. Y., for the practice of architectural, structural and industrial engineering.

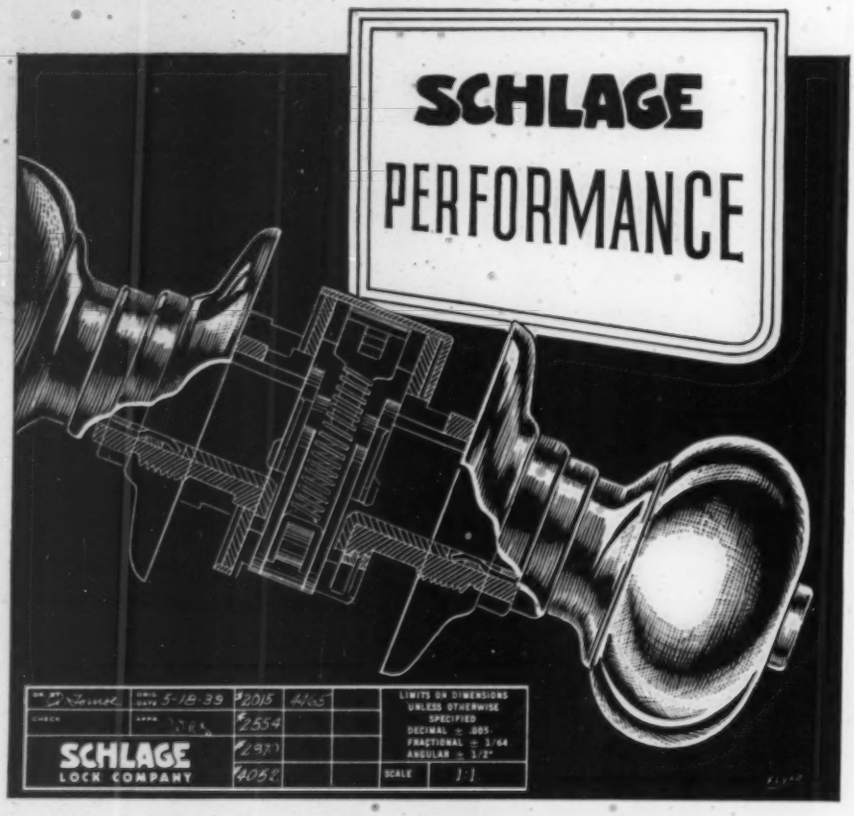
Sidney K. Neill, Architect, has reopened his office at 19 Bank Lane, Nassau, Bahamas.

New Addresses

The following new addresses have been announced:

Advanced Tool & Design Co. (industrial engineering services), 228 S. 4th St., Philadelphia 6, Penn.

IMPLEMENT OF ARCHITECTURE



Actual specifications from Schlage Drawing #C-2315:

"Knob action must be smooth, free, and snappy.
Key action must be smooth, free, and definite.
Knob catch must engage freely and securely.
Check demountable knob feature with P-5126 instruction.
Check for proper hook-up with latch unit."

Such dependable action is assured by perfectly formed parts, manufactured to exacting dimensions.

SCHLAGE
LOCK COMPANY
SAN FRANCISCO • NEW YORK
ORIGINATORS OF THE CYLINDRICAL LOCK

The Ambassador (magazine), 49 Park Lane, London, W. 1, England.

The Architect & Building News (magazine), Dorset House, Stamford St., London, S. E. 1, England.

Burnham & Hammond, Inc., Architects-Engineers, Monadnock Block, 53 W. Jackson Blvd., Chicago, Ill.

Alfred Cook, Architectural and Industrial Photographer, 9 E. 59th St., New York 22, N. Y.

Giffels & Vallet, Inc., L. Rossetti, Associated Engineers & Architects, New York offices, 500 Fifth Ave., Suite No. 10, New York, N. Y.

Holabird & Root, Architects-Engineers-Consultants, 180 M. Wabash Ave., Chicago 1, Ill.

Arthur Rosenstein, Architect, 184 Boylston St., Boston 16, Mass.

Firm Changes

James D. and Eugene W. Beacham have announced their association for the practice of architecture as Beacham Associates, Architects, with offices at Peoples Natl. Bank Bldg., Greenville, S. C.

C. Ralph Fletcher and Raoul L. DuBrul have become associates in the offices of Lester C. Tichy, Architect and Industrial Designer, 369 Lexington Ave., New York 17, N. Y.

Oliver Ingraham Lay has joined the organization of Charles Downing Lay in the practice of landscape architecture, town and site planning, 15 Vanderbilt Ave., New York 17, and Stratford, Conn.

A. Carl Stelling has announced the association of John Robinson Tregenza in the practice of landscape architecture and site planning. Address, 77 Park Ave., New York 16, N. Y.

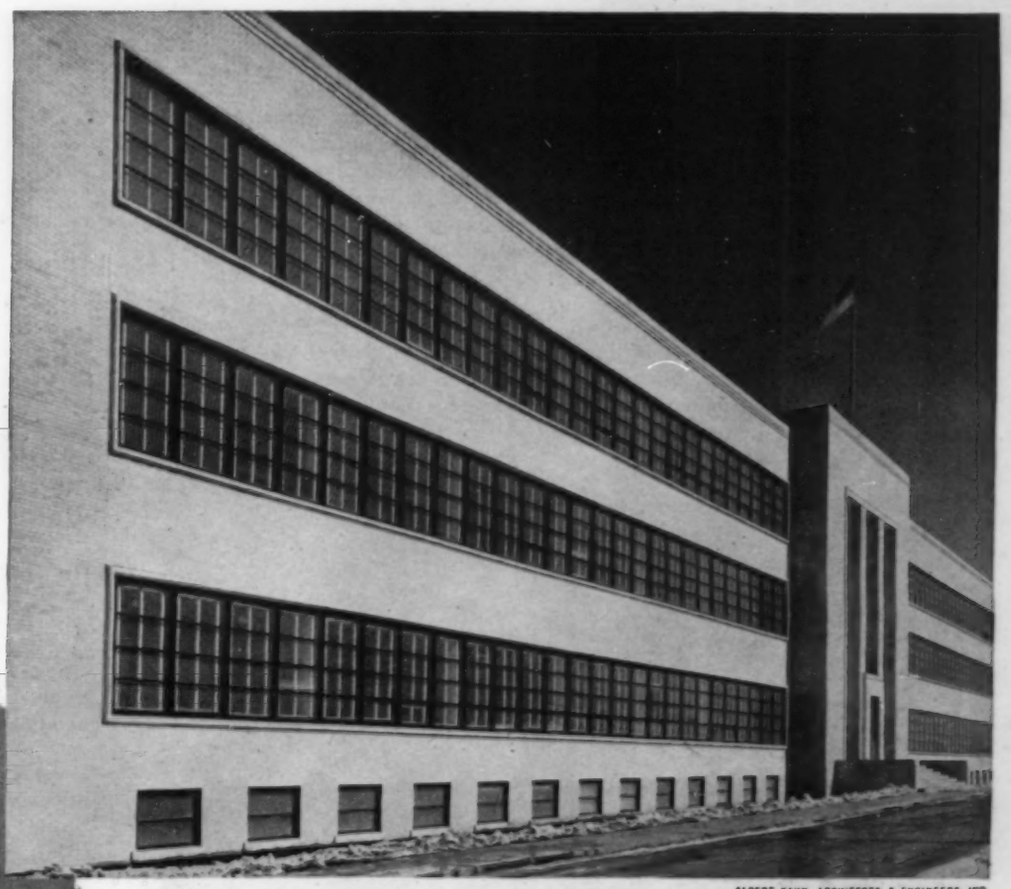
ERRATA

The two apartment projects being built for the Savings Banks Trust Co., shown in the February ARCHITECTURAL RECORD (pages 77 and 85) were incorrectly credited to Harrison, Ballard & Allen, Architects, instead of to William F. R. Ballard, Architect. The firm of Harrison, Ballard & Allen is not an architectural organization, but functions in an administrative capacity as owners' agents.

The photographs of the California residence shown on pp. 88–89 of the October ARCHITECTURAL RECORD were erroneously credited to Philip Fein. They are the work of Mason Weymouth.

ADDENDUM

Contracting work for the New York Port of Embarkation A.P.O. (ARCHITECTURAL RECORD, Oct., 1946, p. 126) was done by John A. Johnson & Sons, Inc., Brooklyn, N. Y. (superstructures); Cayuga Construction Corp., New York City (foundations); concrete block by National Brick Corp., Long Island City.



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Why Steel Windows?

Every building man knows that steel windows are preferred in 90% of the country's industrial, commercial and institutional buildings. Now a nationwide survey made by independent researchers shows four reasons why:

1. Steel windows provide two psychologically desirable factors—30% more natural sunlight and open spaces permitting workers to see out.
2. Steel windows provide the most economical wall construction.
3. Controlled ventilation is best obtained with steel windows.
4. Steel windows cost less than any other type—are durable and fire resistive.

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Here are Ceco points of superiority: (1) Tight weather seal, (2) Easy opening and closing . . . no sticking or warping, (3) Beauty of design to enhance the architectural effect, (4) Bonderizing as a standard for protection against rust.

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Offices, warehouses and fabricating plants in principal cities

In construction products **CECO ENGINEERING** *makes the big difference*

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

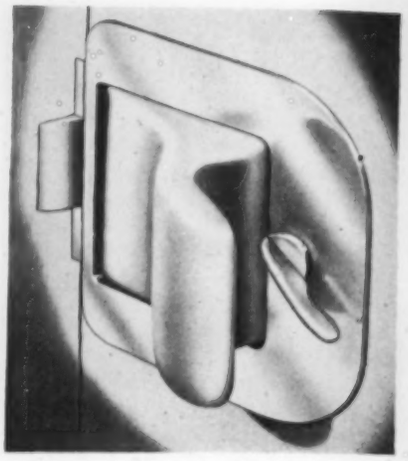
(*Continued from page 136*)

GLAZING CLIPS

In future specifications, glazing clips should be included under "glass and glazing," according to announcement of Detroit Steel Products Co., manufacturer of *Fenestra* steel windows. Glazing clips are no longer being furnished with steel sash orders by the manufacturer, and will be bought by the glazing contractor from his local glass jobbing house. The announcement states that this policy has been adopted by leading manufacturers of steel windows, because previously steel sash makers often were required to supply many more clips than actually were needed and had to replace losses for which they were not responsible.

FINGERTIP DOOR LATCH

The *Parlyn Door Lock and Latch*, introduced in California and soon to be marketed nationally, features a curved latch in place of the conventional doorknob. The door is opened by a slight push or pull of fingertips or hand, depending upon whether the door opens outward or inward. Safety features are claimed for use of this type latch in buildings and institutions where doors open outward, since the pressure of knee, elbow, or body can open the door in emergencies. No. 200 Series (illustrated) has a trip-type lock for bathroom, bedroom, and other private doors; No. 300 Series, (without inside lock) is for other interior doors; and No. 400 Series is for use with cylinder lock in front doors and other doors that are 1¾ to 2 in. thick. Finishes are chrome, bronze, or dull brass. Installation of lock and latch, which come assembled as a unit, requires only a saw-cut slot, 2¼ by 2½ in. deep, into which the unit is slipped in place and secured by two bolts. Parlyn, Ltd., Dept. AR, 707 S. Broadway — Suite 1116, Los Angeles 14, Calif.



New door latch offers finger-tip control

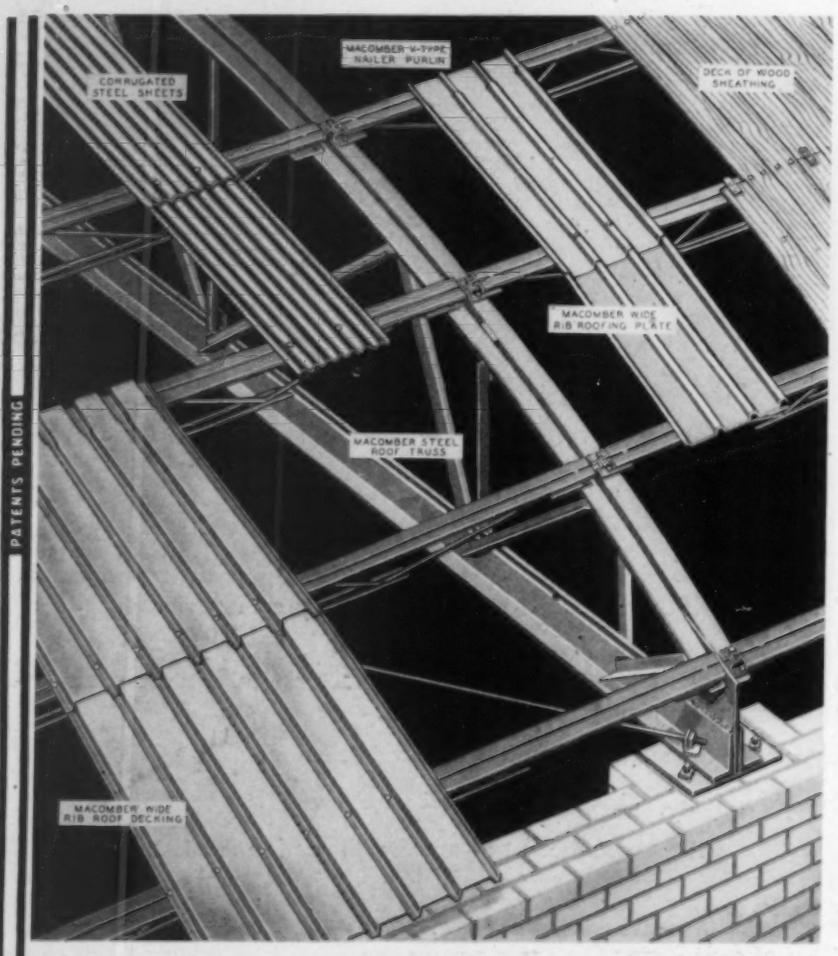
ALUMINUM ROOF COATING

Silvercool, an asphalt-base aluminum roof preservative and insulator, can be sprayed or brushed on wood, metal, felt, asbestos, composition, or asphalt roofs — usually without priming. It is said to reflect 74 per cent of the sun's rays, thereby reducing expansion and contraction of the roof and lowering temperatures within the building. For long roof life, the manufacturer recommends an application of Silvercool once every 5 years. Asphalt Products Co., 1300 S. Lipan St., Denver 10, Colo.

HYGIENIC TOILET

The new *Grenby Hygienic Toilet Seat* offers particular hygienic advantages for installations in hotels and public rest rooms. The seat is continuously exposed to germicidal ultra-violet rays in a vertical cabinet into which it automatically rises when not in use. The

(*Continued on page 160*)



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Macomber All Steel V-Type Nailer Purlins. Shown above are various types of roof decking nailed directly to V Purlins. Specify them for short-cuts to occupancy from standard steel joist loading tables. This modern aid to building is also available in V-type Floor Joists and Studs. For further information write us.

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MEMBER OF THE STEEL JOIST INSTITUTE

Prefabrication Means Known Performance

With BullDog BUStribution DUCT

THERE are two ways to install electrical systems.

One way—*the old way*—is to have the system fabricated on the job site. Until the installation is complete, such vital operating characteristics as voltage drop and temperature rise will be deep, dark mysteries.

Voltage drop can plague your clients' plants by cutting the power and efficiency of motors . . . dragging the output of lighting fixtures down below par. And excessively high operating temperatures are bound to take their toll by impairing performance and shortening the life of the electrical systems.

No Other Systems Offer So Much

The *new way* is the BullDog way, where prefabrication means known performance. BullDog Plug-In Type and BullDog Lo-X Feeder Type BUStribution DUCT are both built in standardized, prefabricated sections, laboratory-tested to provide accurate performance data *in advance of installation.*

No other system can offer this cost-saving feature, so call your nearby BullDog field engineer and learn more about the many advantages of BullDog BUStribution. He'll show you a successful installation near your own office . . . and he'll be on the job to help when the time comes to design your clients' systems.

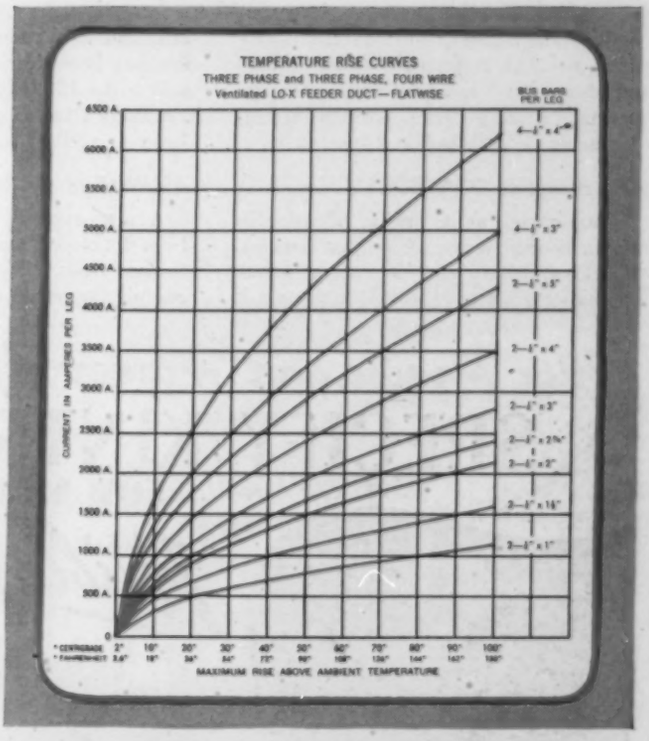
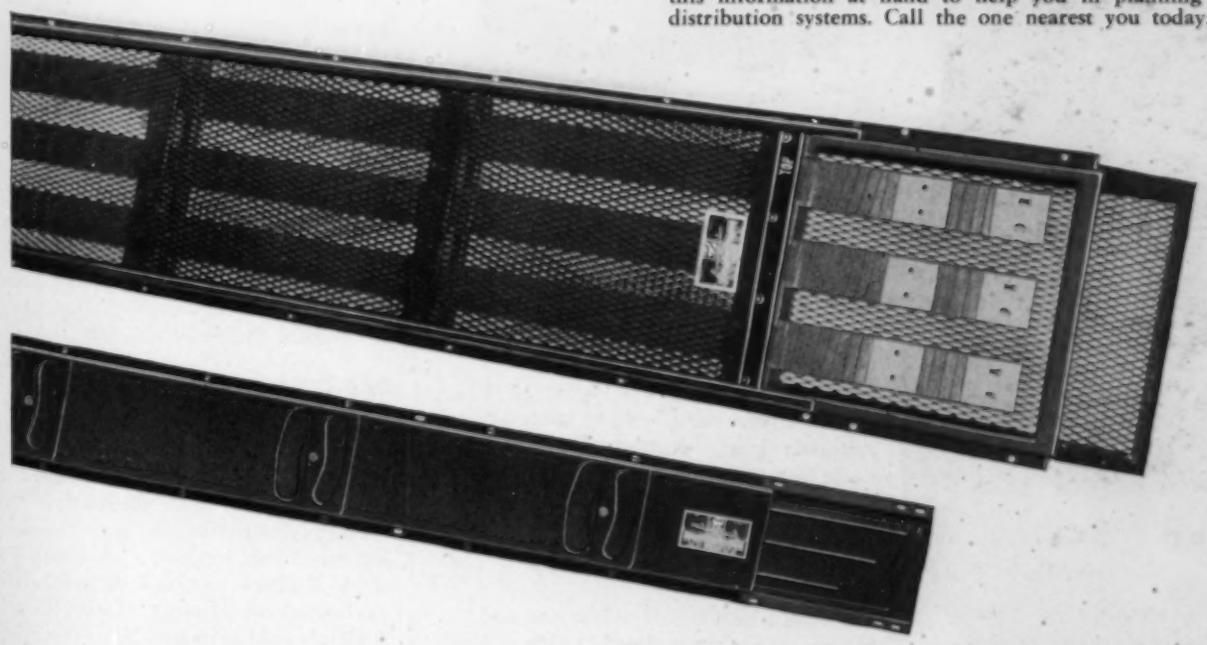


Chart shown is typical of the data on voltage drop and temperature rise available in advance of installation for all types of BullDog BUStribution DUCT. BullDog field engineers have this information at hand to help you in planning electrical distribution systems. Call the one nearest you today.



ADEQUATE WIRING SERVES AND SAVES

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Detroit 32, Michigan. Field Offices in All Principal Cities. In Canada: BullDog Electric Products of Canada, Ltd., Toronto

BullDog manufactures Vacu-Break Safety Switches—SafToFuse Panelboards—Superba and Rocker Type Lighting Panels—Switchboards—Circuit Master Breakers—"Lo-X" Feeder BUStribution DUCT—"Plug-in" Type BUStribution DUCT—Universal Trol-E-Duct for flexible lighting—Industrial Trol-E-Duct for portable tools, cranes, hoists.

(*Continued from page 158*)

seat lowers at the press of a button, and returns to the cabinet automatically after use. As it returns, toilet flushes automatically and General Electric germicidal lamp lights. Grenby Manufacturing Co., Plainville, Conn.

OIL BURNER CONTROL

Announced as a major advance in oil heat engineering, *Fire-Stat Combustion Control* regulates the rate at which combustion air is supplied. Extra air is fed to the flame starting in a cold fire box, and then reduced gradually as the fire box becomes hot. Fuel savings are said to be 15 to 20 per cent. HomEase Products Div., Bogue Electric Co., 300 Iowa Ave., Paterson 3, N. J.

ALUMINUM GARAGE DOOR

A new type of track hardware has been developed for the *Berry Aluminum Garage Door*, which tilts up and rolls completely inside the garage. This door supplements the canopy-type which swings up outside the garage and is unsuitable for certain basement or alley locations. It fits a standard 8 by 7 ft. opening, and needs only 2-in. headroom and 2⅝-in. side clearance. The pressure of a finger is said to be enough to lift and lower it. Power is supplied by a completely enclosed power unit on each side of the door. There are no exposed springs, and no weights are needed. Installation reportedly involves little more than attaching the power unit to the jamb with screws, and hanging the track. Weatherstripping, lock, and striker plate are factory applied. Berry Door Co., Birmingham, Mich.

Garage door of lightweight aluminum

SHOWER CABINET

Lightweight aluminum panel sections are used in a new stall shower cabinet, the receptor of which can be installed on either finished or unfinished floors. Basic design provides for the addition of a standard glass shower door. The cabinet comes complete with welded aluminum receptor, chromium-plated brass caulk-type drain, rubber gasket, and curtain rod. W. R. Ames Co., Dept. AR, 150 Hooper St., San Francisco 7, Calif.

GAS CONVERSION BURNER

A *Fuel Door Burner* permits the conversion of existing furnaces or boilers to automatic gas heat. It is installed in the fuel door, thus eliminating the necessity of removing the grates or making any other extensive alteration. A single model is designed to handle the gas heating requirements of most houses. A simple readjustment varies the input from 50,000 Btu to 200,000 Btu. Handley-Brown Heater Co., Jackson, Mich.

ELECTRIC DUMBWAITER

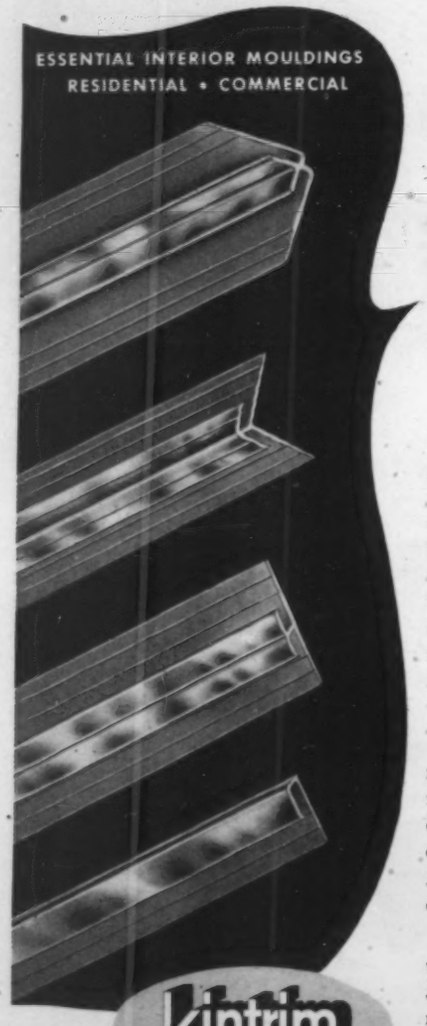
The *Electravator* is an electrically operated dumbwaiter or small freight elevator capable of handling loads up to 500 lb. It operates on a screw-lift action which eliminates the need for rails, counterweights, and cables; and is

(*Continued on page 162*)

Win Praise and Higher Appraisal

SPECIFY KINTRIM FOR MORE *Visible Value*

ESSENTIAL INTERIOR MOULDINGS
RESIDENTIAL • COMMERCIAL



The graceful and lustrous beauty of KINTRIM catches your client's eye—accents features of interior design that, *otherwise*, might go unappreciated. And KINTRIM affords you greater freedom along modern, sweeping lines . . . For these metal mouldings also have the structural precision you need and want for more attractive, practical use of: (1) Wallboards, and (2) Linoleums for walls, counters, and floors.

For "visible value"—to fit covering materials snugly—KINTRIM is precision-made in a complete range of gauges. And every section of KINTRIM Stainless Steel embodies Kinkead's refinement—the *Rolled Edge*—to protect hands and clothes from snagging.

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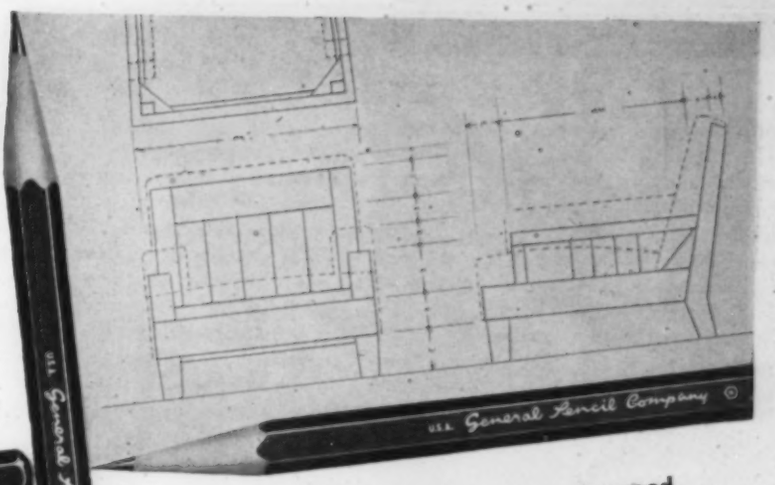
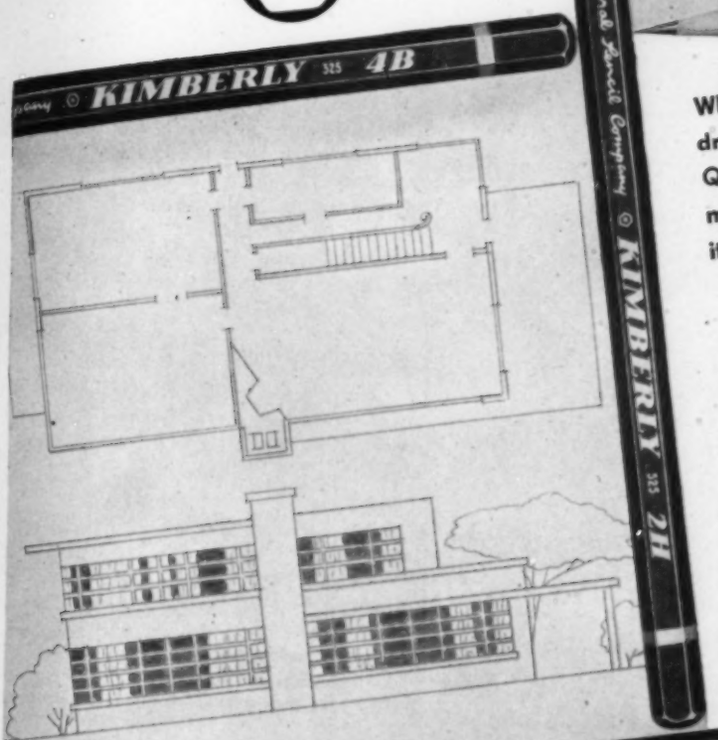
HOUSES—SPIRAL STAIRS
VALVES OR CHAIRS





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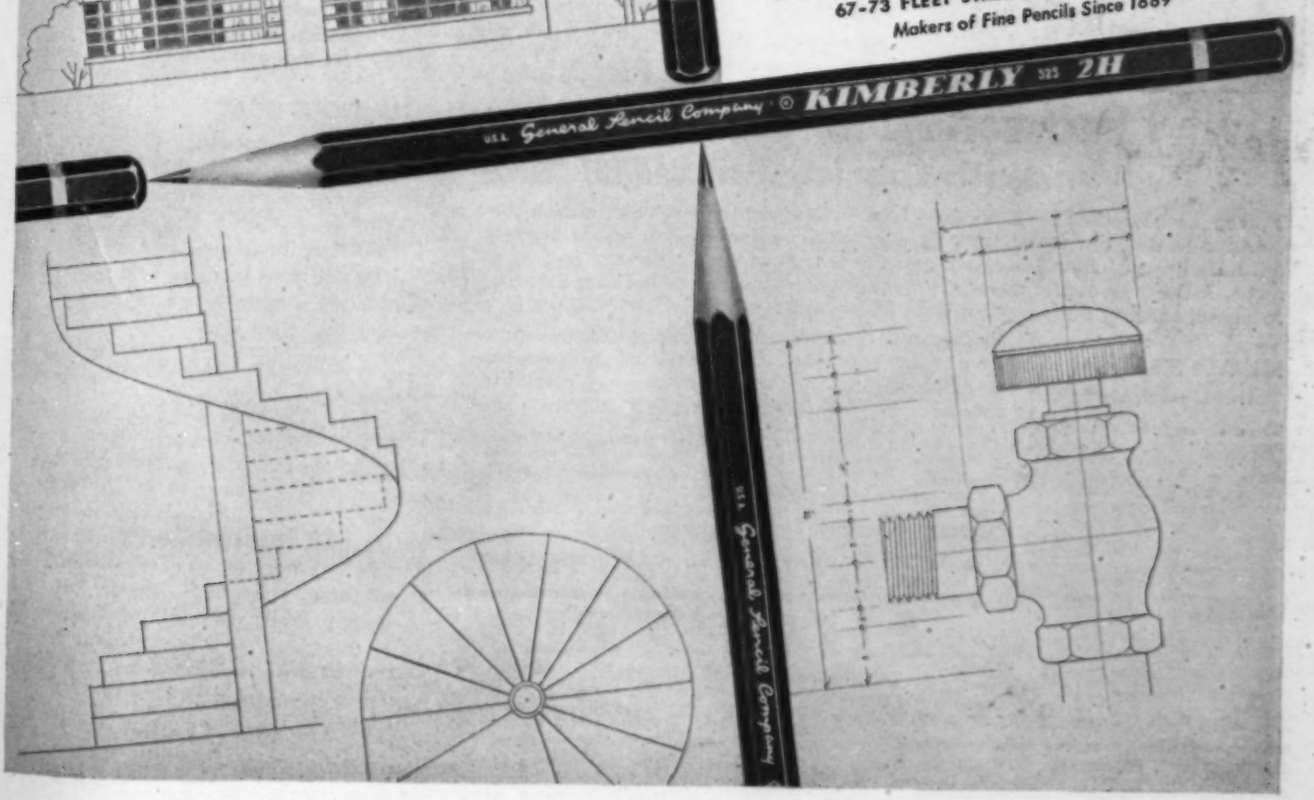
67-73 FLEET STREET, JERSEY CITY 6, N. J.
Makers of Fine Pencils Since 1889



(Continued from page 160)

powered by a 1-h.p., 1750 rpm. motor providing a lift speed of 35 ft. per min. The Electravator may be installed on either side or back wall or under a counter. Beam of the standard model is 15 ft., giving a lift of 12 ft. The entire unit is assembled at the factory and shipped ready to install, complete with limit switches and all controls, but without car, platform, or enclosures. Installation is made by local elevator company. The Electravator Corp., 705 Albany St., Dayton 8, Ohio.

ELEVATOR

An improved line of hydraulic elevators is manufactured in standard sizes for either freight or passenger service, with travel limited to 36 ft. This standardization is said to meet most existing requirements and make possible early delivery at reduced cost. Featured is the plunger construction which employs V-type packing at the cylinder head. Self-adjusting packing conforms to the contour of the plunger,

Elevator features improved plunger

in order to reduce friction and keep pit dry without a drip pan. Cylinder protection is provided by a mastic coating, over which is applied asphalt-impregnated kraft paper, reinforced with Nylon cord. Casing of the well hole reportedly can be eliminated except under the most severe conditions. Montgomery Elevator Co., Moline, Ill.

SCAFFOLD UNIT

The *Quick-Action Scaffold Unit* of welded tubular metal construction consists of five lightweight parts for quick assembly or demounting. Platform heights and widths are said to be quickly and safely adjusted by means of manganese steel hand-set screws. One standard model unit with plank or board across top will provide walkway in small rooms, stairways, and halls; for larger areas several units can be used in combination. Bil-Jax Manufacturing Co., Swanton, Ohio.

LUMINOUS SIGNS

Decorative lighting effects are possible with *Vion* signs that employ a luminescent plastic activated by "black light" from a filter-shielded fluorescent lamp. Operating costs are said to be low since the lamp required is the standard low-watt fluorescent lamp, good for 2500 hr., that plugs into any outlet. Vion Corp., 1311 First Ave., New York, N. Y.

CUSHIONER

The *Isomode* pad is offered as a means of absorbing vibration in all types of equipment from typewriters to forging hammers. Standard pads of this *Neoprene* material are 18 in. square, and 5/16 in. thick, and can be cut to any size desired. When used as a mounting pad or machine base, they eliminate the need for hold-down bolts, skids, concrete mats, or grouting. The MB Manufacturing Co., Inc., New Haven 11, Conn.

(Continued on page 164)

3-WAY PROTECTION for patrons with fabrics that *CANNOT BURN*

Too many tragedies have resulted from flameproofed organic fabrics that could, and did, burn. For the efficiency of flameproofing depends entirely upon the type of chemical used, and the length of time since the last treatment. Moreover, lethal gases are generated when such fabrics are exposed to flame, causing additional deaths from asphyxiation.

BELLEVUE STRATFORD in Philadelphia

The delightfully refreshing atmosphere of this fashionable hotel is safeguarded by three sparkling Fiberglas* fabrics in green and white. Note how deftly the brilliant Tropical Print combines with wide-striped hangings to frame the snowy bubble weave window curtains. *Installed by National Drapery Studio, Philadelphia, Pa.*

Fiberglas* fabrics, woven entirely of finely spun, *inorganic glass* filaments, are as naturally fireproof as your drinking glass. They afford 3-way protection in case of fire:

1—*Permanent non-combustibility.* Never require flameproofing; immune to rot or decay; always operate at 100% efficiency.
2—*Minimize the hazard of suffocation from oxygen depletion* in the event of fire in enclosed places.
3—*Will not emit asphyxiating smoke and fumes* if exposed to flame. Cannot burn, smolder or propagate flame.

WRITE FOR SAMPLES AND INFORMATION

THORTEL
FIREPROOF FABRICS

FIBERGLAS* Listed by Underwriters' Laboratories, Inc., as "Non-Combustible Fabric," approved by the Bureau of Standards and Appeals, City of New York.

ARCHITECTS BUILDING, 101 PARK AVENUE, NEW YORK 17, N. Y. · LEXINGTON 2-0711
Sales representatives or recommended workrooms in: BOSTON, BUFFALO, CHICAGO, CINCINNATI, CLEVELAND, DENVER, DETROIT, LOS ANGELES, NEW ORLEANS, OAKLAND, PHILADELPHIA, PITTSBURGH, ST. LOUIS, TOLEDO
*T.M. Reg. U. S. Pat. Off. Owens-Corning Fiberglas Corp.

GIVE HOME OWNERS what they want

DRY BASEMENTS instead of

BEAUTIFUL STUCCO instead of

DRY INTERIOR WALLS instead of

AT LOW COST *by specifying* "BUILT-IN WATERPROOFING"

Basements that stay dry the year round . . . stucco that is free of disfiguring cracks and stains . . . concrete, brick, and stucco homes with damp free interior walls. These advantages can be obtained easily and at low cost, when you specify "built-in waterproofing"—the Medusa way.

Medusa Waterproofed Portland Cements—White and Gray—eliminate the capillary action that draws water into concrete or stucco. It lines the pores with water repelling material—locked in for the lifetime of the building. Waterproofing can't chip, peel or crack . . . It's built in—throughout every inch of the mass.

No extra time is required to use Medusa Waterproofed Cements—no extra supervision—no added labor. These cements are mixed and placed exactly as ordinary cements, but they make concrete that is safe from water damage—a bonus for your clients. Specify Medusa Waterproofed Cements*—White or Gray—for mortar, for plaster coats on interior walls, and for scratch and brown coats as well as finish coats in stucco. The slight additional cost of waterproofed construction now is only a fraction of the cost entailed to correct water damage later. Be safe—specify "built-in waterproofing"—the Medusa way.

Send the coupon below for your free books.

*Where Medusa Waterproofed Cements are not available, use Medusa Waterproofing Paste or Powder.

"FIFTY-FIVE YEARS OF CONCRETE PROGRESS"

MEDUSA

PORTLAND CEMENT COMPANY

1915 Midland Bldg. • Dept. "I" • Cleveland 15, Ohio

Gentlemen: Please send me copies of the books, "How To Waterproof Concrete, Stucco and Masonry" and "A Guide To Finer Stucco."

Name .....

Address .....

City ..... *State* .....

Also made by Medusa Products Co. of Canada, Ltd., Paris, Ontario

"This boiler can wait 'til the roof is on"

When your client's heating plant is to be H. B. Smith, you can go right ahead and finish your building *before* you install the boiler. This means that when material and labor shortages slow down or stop the job, your new boilers don't have to stand in a half-erected building exposed to the elements.

H. B. Smith boilers can be placed in *any* building, through ordinary doorways, because they are assembled from multiple cast-iron sections. These *sections* are shipped directly to the point of installation, where they are assembled quickly and easily. H. B. Smith header-type construction cuts erection time and costs too.

Once an H. B. Smith *Cast-Iron* Boiler is installed, the owner usually agrees that there is no finer looking, finer performing boiler in service. So when your building schedule calls for a boiler that can be installed "after the roof is on"... or whenever there is need for uninterrupted, efficient low-cost heating... recommend H. B. Smith Boilers, for new installations or replacement. Write for your free catalog.

H.B. Smith

CAST-IRON BOILERS

THE H. B. SMITH CO., INC.
WESTFIELD, MASSACHUSETTS

Offices and Representatives in Principal Cities

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(*Continued from page 162*)

All-steel steps and sides for cellar way

CELLAR STAIRS

Considerable savings in construction time and costs are claimed for *Bilco Stair Units*, which include steel side walls for the cellar way and steel risers and treads. The builder need only leave an opening in the foundation wall and equip it with 5 anchor bolts on each side for fastening the side walls of the stairs. The cellar stair unit can then be assembled on the ground, slid into place and caulked along the seams. Closing is provided by the *Bilco Door*, of copper steel. The Bilco Co., 164 Hallock Ave., New Haven, Conn.

DOOR RELEASE

The *Balch Door Release* is a platform unlocking device for releasing glass exit doors automatically from the inside, designed for schools, theaters, auditoriums, and public buildings requiring emergency exit doors. As a person approaches, his weight upon the platform operates a latch mechanism, releasing the doors which lock again automatically upon closing. A hold-down device makes the doors free-operating when so desired. There also is a cylinder lock, protected by a slide cover, below the exterior face of the threshold so that the door can be unlocked from the outside. Balch Glass Exit Door Release Co., Dept. AR, 1725 Silver Lake Blvd., Los Angeles 26, Calif.

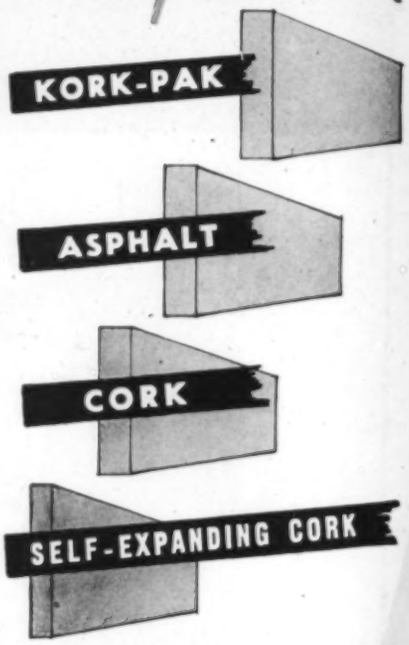
ONE-COAT PAINT

The manufacturer of *Sta-Par* paint announces it as a white exterior paint with the ability to seal, prime, and finish surfaces in only one application. It is ready mixed and suitable for unpainted wood, previously painted wood, masonry, concrete block, or metal. The paint base is soybean oil which reportedly makes possible an unusually high zinc-oxide content, for increased resistance to sunlight. Sicca Soya Sales Co., 415 S. Washington St., Peoria, Ill.

(*Continued on page 166*)

SERVICISED PREMOLDED EXPANSION JOINT FILLERS

for HIGHWAYS . . . DAMS AIRPORTS . . . BRIDGES . . . TUNNELS and GENERAL CONSTRUCTION



★ KORK-PAK

Non-Extruding KORK-PAK Fiber Joint is a composition of bitumen and cork, preformed between felt strips, and designed to incorporate various desirable qualities.

★ ASPHALT

Premolded ASPHALT Joint is a mixture of asphalt, fiber, and mineral filler preformed between felt strips. The standard joint for use where concrete slabs are not subject to excessive movement, and some extrusion is not objectionable.

★ CORK

Non-Extruding CORK Joint is an excellent type where a construction job requires the consideration of a resilient, non-oozing joint. Specified for use in dams, swimming pools, reservoirs, tunnels, bridges.

★ SELF-EXPANDING CORK

Non-Extruding SELF-EXPANDING CORK Joint is designed especially for concrete slabs that contract beyond their original set.

SERVICISED EXPANSION JOINTS are specified by State Highway Departments and Army & Navy Engineers throughout the country.

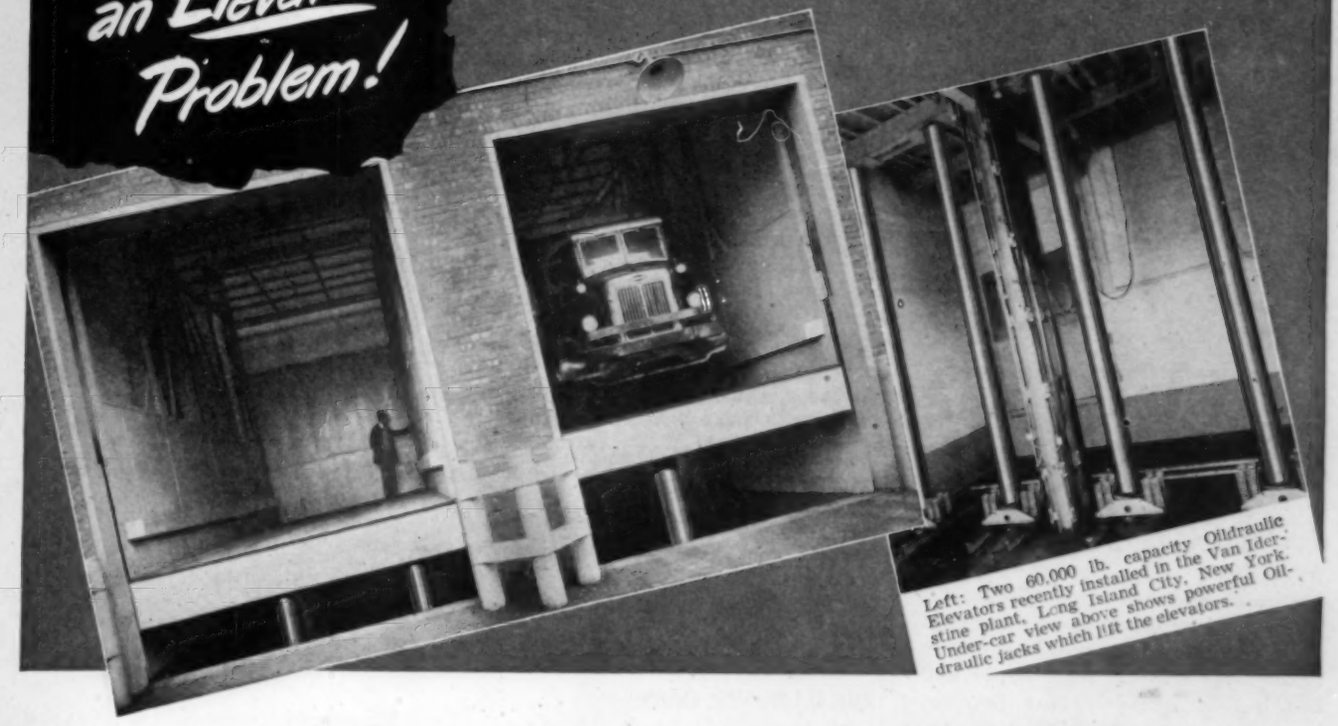
Write for further specific information.

See our catalog in SWEET'S

SERVICISED PRODUCTS CORP.
6051 West 65th Street Chicago 38, Ill.

Solution to an Elevator Problem!

When you're planning a 2, 3 or 4 story building and heavy duty elevators are required . . .



Left: Two 60,000 lb. capacity Oildraulic Elevators recently installed in the Van Iderstine plant, Long Island City, New York. Under-car view above shows powerful Oildraulic jacks which lift the elevators.

You get these important advantages by specifying "the elevator that's pushed up"

LIGHTER SHAFTWAY STRUCTURE

No need for heavy, load-bearing supporting columns to carry the elevator and its load. The Rotary Oildraulic Elevator is **pushed** up from below by a powerful hydraulic jack . . . not pulled from above.

ACCURATE LANDING STOPS

Guided by the highly efficient "Oildraulic Controller," this modern elevator operates smoothly and stops at floor landings with accuracy. Very important where loading and unloading is by power vehicles.

NO COSTLY, UNSIGHTLY PENTHOUSE

The Oildraulic Elevator does away with the penthouse that interferes with modern, streamlined designs. No special machine room required either . . . compact power unit can be located in any convenient space.

RUGGED, HEAVY-DUTY CONSTRUCTION

Every Rotary Oildraulic Elevator is built to take hard wear. Construction is extremely rugged, with heavily reinforced sling and platform. Owners everywhere say this elevator gives dependable, lowest cost service.

For data to help solve your elevator problems

ROTARY LIFT CO.,
1002 Kentucky,
Memphis (2), Tenn.

Send complete information and Architect's Preliminary Layout Data.

Name .....

Address .....

City & State .....

Rotary

OILDRAULIC ELEVATORS

Architects

SPECIFY

HILLYARD *Products*

BECAUSE....

Hillyard's Floor Seals, Finishes and Treatments properly protect and prolong the life of all types of floors. Floors stay cleaner, look better and last longer. Many leading flooring manufacturers and contractors approve Hillyard Products because they have given and are giving entire satisfaction in uniformity, dependability and economy. Write for literature on Hillyard products for every type surface.

HILLYARD SPECIFICATION CARDS

See Hillyard Specifications in Sweets 1946 Catalog. Sec. 13 Pages 13G-2

Send for Specification Cards. FREE for the asking

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1947 BROADWAY • NEW YORK, N. Y.

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(*Continued from page 164*)

FLOOR FURNACE

A new automatic oil-burning floor furnace is designed to supply the heating requirements of the average small house. Equipped with a galvanized outer casing, the furnace measures 36 3/16 in. in length, 24 3/16 in. in width, and 41 3/4 in. in overall depth. Shipping weight is approximately 190 lb. Complete installation is said to require only the cutting of a centrally located floor opening to accommodate furnace dimensions; insertion of stack and fuel line connections; and the provision of proper ground clearance of a few inches on bottom and sides. The furnace operates on No. 1 fuel oil or kerosene, and has an output of 50,000 Btu. Maximum oil flow is set at ½ gal. per hr. with a pilot flow rate of 4 cc. of oil per min. The connection arrangement between combustion chamber and heat exchanger reportedly permits normal servicing from floor level; burner is designed for clean operation on low draft. J. L. Gillen Co., Dowagiac, Mich.

MULTI-LOUVER DAMPER

The New *Aerofuse Multi-Louvre Damper* features uniform control, quiet operation, and a tamperproof locking mechanism, for commercial air-conditioning, heating, and ventilating equipment. The damper can be completely closed, opened, or left in any position by turning the handle in the center of the unit. Louvers can be locked in position, and, if desired, operating handle and rod may be removed. Tuttle & Bailey, Inc., New Britain, Conn.

MICROFILM

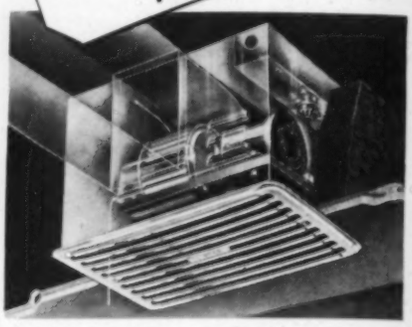
Pointing to "13,000,000 blueprints reduced to file-size books for U. S. Army Ordnance," a microfilming company suggests that engineers, architects, and manufacturers duplicate their entire files of original drawings in microfilm. It now offers, in addition to the photographing service, a *Microfilm Reader* which projects either 16 mm. or 35 mm. film in its own convenient viewer. Holbrook Microfilming Service, Inc., 350 Fifth Ave., New York 1, N. Y.

AUTOMATIC FLUSHING

Better control over the flushing of urinals in toilet rooms is claimed for the *Flushometer*, which substitutes electric time-clock control for hand flushing. The system is designed to operate on 60-cycle 110-volt alternating current, and is timed for 5-min. intervals during the day and 1-hr. intervals at night. Sloan Valve Co., 4100 Lake St., Chicago.

(*Continued on page 168*)

Specify PACKAGED VENTILATION For Small Rooms



CLIPPER BLOWERS

Here's a complete, packaged ventilating unit that is engineered to do a big job in small rooms.

The Clipper is specially designed for ventilating kitchens, bathrooms, ticket booths, X-ray rooms, toilets, clinics and other small rooms.

Mounted between ceiling joists and vented outside, the Clipper traps and expels unwanted air.

Not a blade-type fan, but a quiet squirrel cage blower—a complete packaged unit. Patented construction with the motor entirely removed from air stream, means greater efficiency, longer life, easier servicing.

At leading dealers from coast to coast.

The Clipper is a complete packaged ventilator which is hidden in the ceiling. Only an inconspicuous "dripless" ceiling grille is visible, yet motor and blower assembly are instantly removed without tools for service.

TRADE-WIND MOTORFANS, INC.
5707 S. MAIN STREET, LOS ANGELES 37, CALIF.

Work in
COOLER COMFORT
this hot summer!
PROTECTED BY
KOOLSHADE
SUN SCREEN
The sun "sees" KoolShade like this
In effect, KoolShade is a miniature venetian blind with the "slats" permanently set at a 17 degree angle to block, absorb and radiate up to 90 percent of the sun's heat rays outside the window.

Your office can be as much as 15° cooler . . . *on the hottest days!*

Summer will soon be here, and with it—*blazing heat!* Don't endure another season of sweltering misery when a KoolShade installation can assure you cooler comfort all summer long. KoolShade makes sun-exposed rooms as much as 15 degrees cooler by blocking and radiating up to 90% of the sun's heat rays *outside your window!* Yet vision from inside is crystal clear, and there's an abundance of glareless light!

KoolShade is easily installed like ordinary insect screen. It requires no maintenance . . . will never rot, rust or rattle. Keeps out insects, too. Order KoolShade *now* to assure installation before hot weather begins. It will pay you big dividends in personal comfort and increased working efficiency!

NOTE THESE VALUABLE FEATURES

- *Permanently set at 17° angle for greatest shading efficiency.*
- *Prevents the fading of valuable drapes and furnishings.*
- *Easy and inexpensive to install—will not rot, rust or rattle.*
- *Fits neatly and smoothly into modern architectural design.*
- *Durable bronze KoolShade also effective as insect screen.*

MAIL THIS COUPON TODAY FOR COOLER COMFORT ALL SUMMER! ➔

KOOLSHADE
Cuts Air Conditioning Costs . . . Increases Efficiency

KoolShade Sun Screen is the most efficient shading device known to air conditioning engineers! Where air conditioning systems are in use, KoolShade reduces operating costs. On new air conditioning installations an excellent cooling job can be done with less expensive equipment when KoolShade is used on all sun-exposed windows.

Ingersoll
KOOLSHADE SUN SCREEN

PRODUCT OF BORG-WARNER

® Trade Mark Property of INGERSOLL STEEL DIVISION • BORG-WARNER CORPORATION

Ingersoll Steel Division
Borg-Warner Corp., Dept. M4
310 South Michigan Ave., Chicago 4, Ill.

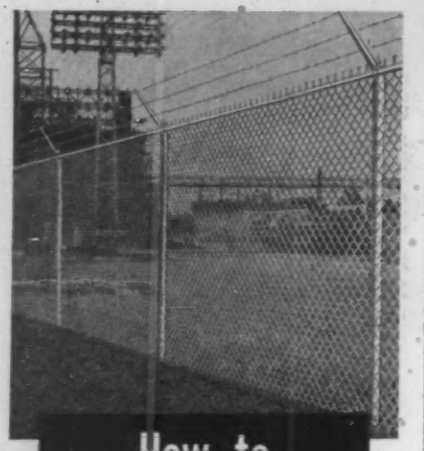
Please send free sample and literature, also the name of my nearest KoolShade distributor.

Name.....

Company.....

Address.....

City..... State.....



How to SPECIFY FENCE that gives LONGER LASTING PROTECTION

1. *Consider these four exclusive features of Anchor Chain Link Fence* which mean all-out protection during long years of service for your clients. *Deep-Driven Anchors*, which hold the fence erect and in line, in any soil or weather, yet permit easy relocation where necessary. *Square Frame Gates*, amazingly free from warping and sagging. *U-Bar Line Posts*, self-draining, rust-free and rigid. *Square Terminal Posts*, which improve strength, durability and appearance.

2. *Send for your free copy of our book, "Anchor Protective Fences,"* for your A. I. A. File 14-K. It's both a catalog and specification manual. Shows many types and uses of Anchor Chain Link Fence . . . pictures installations for many prominent companies and institutions . . . contains structural diagrams and specification tables. Just ask for Book No. 110. Address: ANCHOR POST FENCE DIV., Anchor Post Products, Inc., 6600 Eastern Ave., Baltimore 24, Maryland.

Anchor Fence

Nation-wide Sales and Erecting Service

ARCHITECTURAL ENGINEERING

TECHNICAL NEWS AND RESEARCH

(Continued from page 166)

VENTILATOR

A 12 by 12 in. grille of *Beetle plastic* forms the visible part of a built-in wall ventilator, powered by a 3-bladed propeller type fan and enclosed constant-speed motor, for kitchens, bathrooms, game rooms, or offices. It has a certified rated capacity of 400 c.f.m. (standard test code). The plastic grille is designed for minimum resistance to air flow, and for easy cleaning. American Blower Co., Detroit, Mich.

PAINT

Quigley Triple-A paints and finishes are offered for house exteriors, interiors, and trim. Featured are Westchester White Paint for exterior finish, Architectural White Enamel for interiors, and Trim and Trellis Paint in colors. This company also makes a number of other paints, primers, preservatives, varnishes, enamels, and coatings. Quigley Co., Inc., 527 Fifth Ave., New York 17, N. Y.

FIBERGLAS SIDING

Fiberglas forms the base material of an asphalt type of *Ford-V-Neer* panel siding. Since Fiberglas is an incombustible and inorganic material, this siding is reported to have increased resistance to such building enemies as fire, rot and decay, moisture and shrinkage, and the attack of vermin and termites. It also has the added advantages of light weight, which permits the use of panel sections in larger sizes, reducing application time. Insulating qualities are said to be exceptionally good. This new siding is manufactured in panels, 5/8 in. thick, 24 in. by 36 in., shiplapped on four edges. It comes in colored patterns, simulating brick or stone. Ford Roofing Products Co., 111 W. Washington St., Chicago 2.

GRILLES

Tri-Flex grilles and registers are offered in 26 standard sizes to cover the full range of commercial, industrial, and institutional air conditioning installations. Air delivery is controlled in its direction, throw, and drop. The multi-shutter damper also affords volume control. Tuttle and Bailey, Inc., New Britain, Conn.

DRAFTING SCALE

A new drafting scale, called *Vant Rule*, has all the customary architectural scales calibrated on one side. It is of clear plastic, with calibrations and numerals in red to facilitate reading against black and white drawings or blueprints. All edges are beveled. Stewart Jackson Instrument Co., Dept. AR, 215 West 7th St., Los Angeles 14, Calif.

VAPOR CONDENSATION YOU CAN SEE May Be Funny . . .

but "In-Wall" Condensation IS NO LAUGHING MATTER

The same vapor that "steams up" windows can make insulation soggy and impair its efficiency if it condenses within walls. Condensation is the deadly foe of insulation. Uncontrolled condensation can cause wall stains, paint peeling, hasten structure rot. A sure way to lick "in-wall" condensation and give life-long protection to insulation is with a *separate* vapor barrier. Standard with architects the country over is Bird Neponset Black Vapor Barrier. Applied on the warm side of insulation, Bird Neponset Black safely repels vapor, keeps insulation at peak efficiency. Costs only about $20. for a $10,000 building. Consult Sweet's Architectural file, 9b-2, or write Bird & Son, inc., 156 Wash. St., E. Walpole, Mass., for sample.

VAPOR BARRIER
OUTSIDE OF WALL COLD SIDE
INSIDE OF WALL WARM SIDE
SHEATHING
STUD
Specifications: roll width: 36"; Sq. feet: 500; approximate wt.: 50 lbs. Asphalt Saturated. Coated both sides with glossy asphalt surface. Meets Federal Specifications UU-P-536 Grade B.
BIRD Neponset PRODUCTS

BIRD & SON, inc. CHICAGO NEW YORK SHREVEPORT

EAST WALPOLE, MASS.

Home Owners look upon Architects as "miracle men" when they explain the advantages of BASE-RAY *Radiant Baseboard Heating*

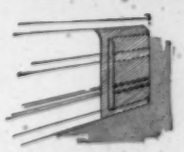
It's a good story to tell . . . a story of uncluttered floors and cold weather comfort that's wholly new. You can point out to your clients the design advantages of room-length BASE-RAY* heating units that take the place of baseboards on outer walls. You can tell them how ankle-height heating units mean warm floors and evenly distributed heat . . . that even in sub-zero weather the floor-to-ceiling temperature differential is only 3°.

It's a story we are constantly telling the home-conscious public through national advertising . . . and one that has created enthusiastic response. If you are not already familiar with BASE-RAY *Radiant* heating, get all the facts now. Mail the convenient coupon TODAY so you'll be ready with the answers to questions you'll surely be asked.

CONSIDER THESE FACTS: No structural changes are necessary for BASE-RAY installations in new homes or alteration jobs. These hollow cast iron units, 7" high and 1¾" deep, are easy to install — your Heating Contractor can do a good job. May be used with any type hot water system as well as 2-pipe steam and vapor jobs. When painted to match, BASE-RAY units become, as far as the eye can tell, part of the regular trim. BASE-RAY assemblies up to and including 6 lineal feet are shipped in one piece. Longer assemblies are shipped in two or more pieces.

*Reg. U.S. Pat. Off.

BURNHAM
BASE-RAY
RADIANT BASEBOARD



CONCEALED VALVES

This neat metal enclosure, shaped like the heating unit itself, is attached to each end of BASE-RAY, thus completely concealing all valves and fittings.

MOLDINGS

To provide an even more realistic baseboard appearance and to compensate for irregularities sometimes found in walls and floors, regular wood moldings are added at top and bottom of "Standard" BASE-RAY and at top only of "Hy-Power" units.

Write today for this FREE Booklet, which gives ratings and installation data on BASE-RAY Radiant Baseboards.

Burnham Boiler Corporation

IRVINGTON, N. Y., Dept. AR47

Members of the Institute of Boiler and Radiator Manufacturers

Burnham RADIANT HEATING SINCE 1873

Burnham Boiler Corporation — Dept. AR47
Irvington, New York

Please send me copy of "Ratings and Installation Guide on BASE-RAY Radiant Baseboards".

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